APRIL • 1958

MPM

Metal Products Manufacturing

Serving the Appliance and Fabricated Metal Products Industry

When a fine finish counts

specify Shell Chemical products for surface coatings

If you make surface coatings—protective or decorative—you'll find the answer to both quality and economy in solvents and resins from Shell.

Shell's family of *solvents* meets or exceeds highest standards, providing complete formulating flexibility. For resistance to abrasion, impact and chemical attack, Shell's *Epon® resins* are proving unsurpassed in a wide range of coating applications.

And, in the manufacture of alkyd resin and ester gum coatings, Shell *glycerine* assures both quality and performance.

For information and technical literature on specific products to solve your specific needs, write to:

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CHEMICAL SALES DIVISION

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Acetone
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Epon® Resins
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Isopropyl Alcohol
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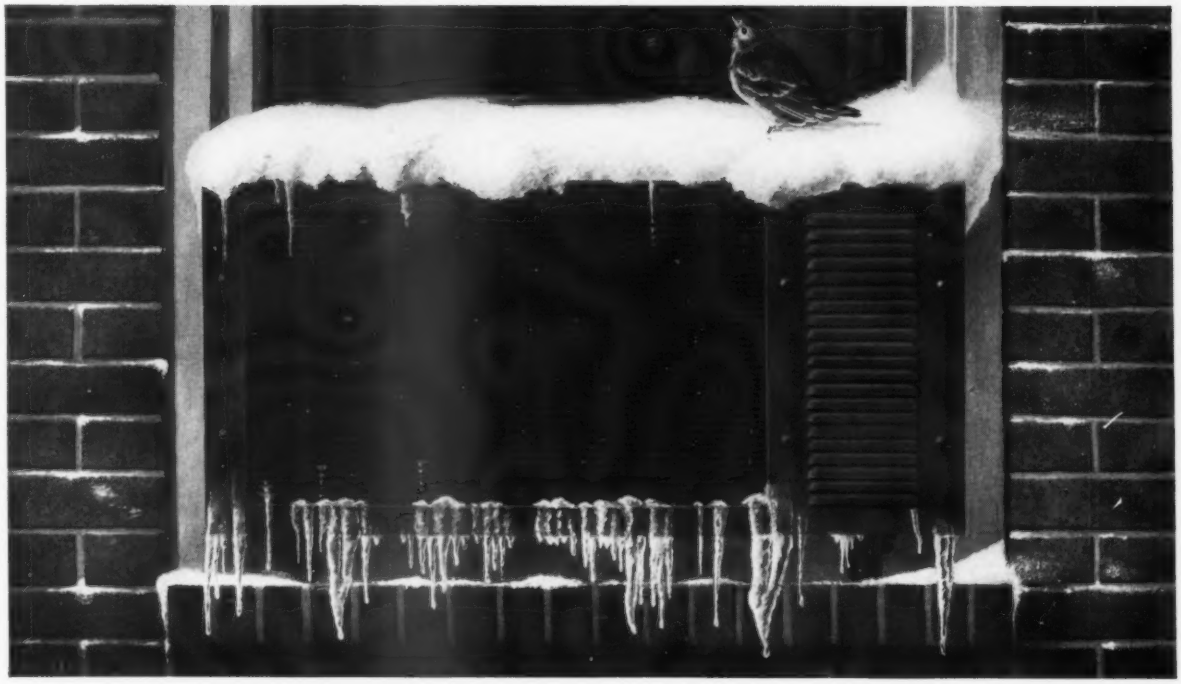
Mesityl Oxide
Methyl Ethyl Ketone
Methyl Isobutyl Carbinol
Methyl Isobutyl Ketone
Neosol® Solvent
p-Tertiary-butyl Benzoic Acid
Secondary Butyl Alcohol

SHELL

How to weatherproof an air conditioner



Simply make all exposed parts of Armco ZINCGRIP PAINTGRIP®. This way you can have an attractive, durable casing that seals out weather—keeps air conditioners, or any product, *doubly* protected. Here's why:

1 Both sides of this special Armco steel are coated with a protective layer of zinc. The specially applied hot-dip zinc coating protects the steel from the atmosphere. Even when an accidental scratch or blow penetrates the coating, attack is not progressive. What's more, this zinc coating doesn't flake or peel off in fabrication. It offers unbroken zinc protection.

2 Finishes go on easily and *stay* on. The paint-preserving mill-Bonderized surface of ZINCGRIP PAINTGRIP takes paint or baked enamel without pretreatment of any kind. The purpose of the phosphate film is to *insulate* finish coats from the zinc, and to provide a surface that will hold the finish in a tight bond.

ZINCGRIP PAINTGRIP is only one example of the many special steels developed by Armco to help you insure your product's performance . . . solve a design or manufacturing problem. For more complete information just clip and send the handy coupon below. Do it today.

Armco Steel Corporation
328 Curtis Street, Middletown, Ohio

Please send me more information about Armco ZINCGRIP PAINTGRIP.

We manufacture_____

Name_____

Company_____

Street_____

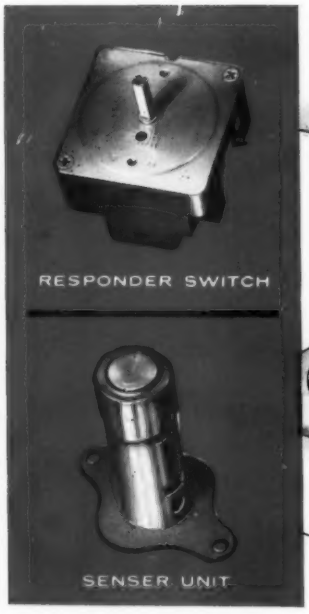
City_____

Zone____ State_____

ARMCO STEEL

ARMCO STEEL CORPORATION, MIDDLETOWN, OHIO

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION



MORE ADVANTAGES . . .
. . . GREATER ECONOMY
in the NEW CHEF-O-MATIC SURFACE ELEMENT TEMPERATURE CONTROL, *Just Announced*

New Features

- Smaller, more compact, easy to install
- Quick, snap-on terminals
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- Temperature compensated up to 220°F ambient
- New convenient temperature adjustment to compensate for altitude, or differences in ranges, at point of use
- Lower cost

Features of Original Model Retained

- All electric, wire connections only. No tubes or other mechanisms to fuss with
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- Anticipating feature of proportioning control limits over-shoot
- Infinite number of precision settings, on a linear scale, in either direction of knob rotation
- Temperature control range—100°F to 450°F
- Single unit can control any wattage element up to 3500 watts, including split coil types
- All units completely interchangeable
- Reduces inventory and installation problems
- User safety assured by low voltage system between senser and responder switch.
- Only one transformer for any number of surface units
- Rugged senser—withstands up to 800°F
- Automatically reduces wattage when cooking utensil is taken off surface element

8001

Write for detailed specifications and costs

KS KING-SEELEY CORPORATION ANN ARBOR, MICHIGAN

APRIL • 1958

VOL. 15 • NO. 4

MPM

(including finish)

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NBP EPA

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METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $8.00 per year, domestic. To all other countries $10.00 per year (U.S. funds). Single copies, $1.00.

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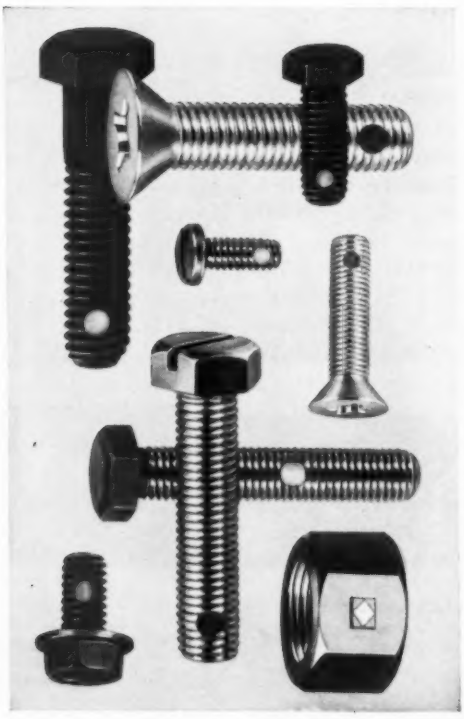
"We've built a better mouse trap with REPUBLIC ELECTRO PAINTLOK SHEETS"

"If we expected the world to beat a path to our door," continues Mr. Coughanor, "we knew every detail of design and material in the Self Sett Trap had to be exactly right. As a result, extensive tests have been conducted which prove design efficiency. And experience has proved Republic Electro Paintlok is the best steel sheet we can buy for economy, long life, and excellent paint-holding qualities. The combination of these factors gives us the best, safest, most foolproof product on the market."

This enthusiasm for Republic Electro Paintlok® is echoed by many other product manufacturers faced with a wide range of forming and application problems. The reason is the chemically treated zinc surface of Republic Electro Paintlok which leaves the mill in prime condition for painting, and won't crack, flake, or peel under any forming operation permitted by the base metal.

These features of Electro Paintlok protect the applied finish of completed products—holding it tightly and restricting corrosion to the point of damage if it should be scratched through.

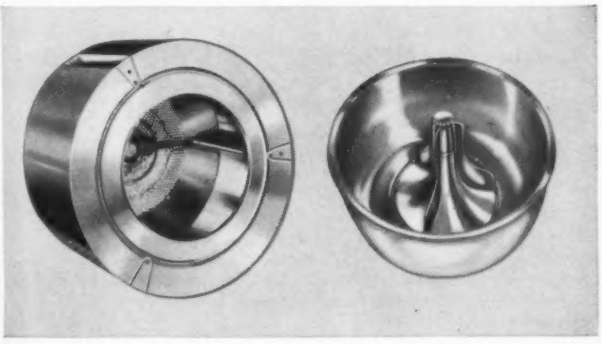
If you want to "build a better mouse trap" in your product field, it will pay you to get all the facts on versatile Republic Electro Paintlok. Contact your Republic representative or mail coupon.



BETTER ADHERENCE OF ZINC COATING on Republic Continuous Galvanized Steel Sheets, as compared with old-fashioned, hot dipped sheets, permits severe forming without damage. For example, Republic Continuous Galvanized is shown being fabricated into a beverage cooler liner box. Total operations include shearing, blanking, piercing, forming, flanging, soldering, beading, and Pittsburgh Lock Seaming. Send for details.

BETTER SERVICE FROM BOLTED ASSEMBLIES subject to impact and vibration can be secured when they are fastened with Republic Nylok® Bolts and Nuts. The resilient nylon pellet imbedded in the body of bolt or nut forces a tight metal-to-metal lock between opposite mating threads. Pellet is unaffected by age or moisture and permits both adjustment and re-use without loss of holding power. Lock is secure even if fastener is not seated. For details, send coupon.

says Mr. E. S. Coughanor, President, Self Sett Mouse Trap Company, Cleveland, Ohio



OPERATION OF THE SELF SETT MOUSE TRAP, as indicated here by Mr. Coughanor, depends on both ingenious design and corrosion resistant materials. A series of automatic doors and pivoted ramps leads the rodent to his destruction in a tank of water. The special coating on Republic Electro Paintlok holds painted finish securely to provide long-term corrosion resistance required to maintain trap operating efficiency.

BETTER-THAN-EVER PERFORMANCE and sales appeal are assured by the use of Republic ENDURO® Stainless Steel for both tub and drum in Speed Queen's Royal Pair Automatic Washer and Dryer. Speed Queen, a division of McGraw-Edison Company, Ripon, Wisconsin, specifies ENDURO for two basic reasons. First, its gleaming, smooth, hard surface provides maximum protection for the finest fabrics. Second, ENDURO is unaffected by dyes, soaps, or detergents. These and other advantages may help you solve a product or production problem with ENDURO. Send coupon for data.

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☐ Continuous Galvanized Sheets ☐ Nylok Fasteners

Name _____ Title _____

Company _____

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Control Engineering Bulletin

CC SORENG

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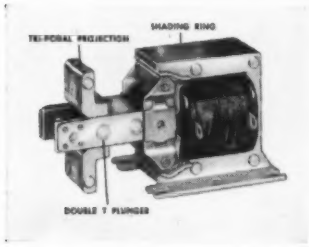
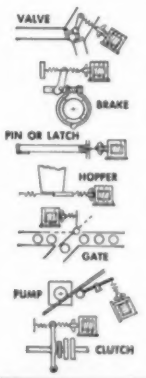


NEW SORENG DOUBLE T DESIGN SOLENOID PACKS MORE PULL FOR MORE APPLICATIONS

The inherent design superiority of Soreng double T (TT) solenoids makes the big difference. Exclusive double T plunger construction results in more pull at point needed. For constant or intermittent duty. And Soreng solenoids are more efficient — thanks to stable tri-podal seating and tightly locked shading rings.

These features are custom-built in four sizes offering 12 stock solenoid models. Available in 110 V and 220 V. They satisfy virtually any application at production run prices.

DOUBLE T SOLENOID APPLICATIONS



1 Valve actuation
2 Clutch operation
3 Switch function
4 Metering devices
5 Shutter and damper control
6 Door locks — electric latches
7 Interlocks — automation
8 Mechanical control
9 Electrical brakes

FREE . . . New bulletin and handy solenoid selector . . . YOURS for the asking!

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Company .....
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City ..... Zone ..... State .....

From the Editor's Mail

MPM helpful to reader

Gentlemen: Your publication has been recommended to me as the best publication in the world to assist in appliance design, and I am wondering if you could include my name on your mailing list.

I have just been appointed Head of Merchandise Design for my company, Australian Electrical Industries Pty. Ltd., and am naturally anxious to obtain all publications that would be of assistance in this work.

If you can assist me it would be much appreciated, and I would ask you to forward this publication to me at the address below.

G. W. Noble
Asst. Chief Design Engineer
Australian Electrical Industries Pty. Ltd.
New South Wales, Victoria
Queensland, South Australia

Liked enameling article

Gentlemen: Dana Chase, Jr. was kind enough to send me an extra copy of the March issue of METAL PRODUCTS MANUFACTURING. I had previously had an opportunity to review the personal copy that I had already received. You and your entire staff are to be congratulated, as usual, on this particular issue.

I would like to tell you how pleased we at Ingersoll are for the recognition that has been given to us on the pioneering work that we have been carrying on in the area of low temperature enameling for the past two years. We think that you have done an excellent job in portraying the progress that we have made and the current status of our program. We are convinced that future improvements of a substantial nature will be made. This is to be expected with any new product; however, we do feel that we have come a long way since the product was first called to our attention.

Again, our thanks for a job well done!

J. H. Ingersoll
President
Ingersoll Products Division
Borg-Warner Corp.
Chicago, Ill.

MPM readership grows

Gentlemen: As you know, I plan to start in business in Denver, Colorado as a Technical Consultant on Metal Fabrication and I would appreciate your sending me your "METAL PRODUCTS MANUFACTURING" magazine.

Your excellent coverage of metal fabrication and finishing is, I believe, one of the best sources for keeping abreast of the latest developments in these fields.

Until I can get located and forward a permanent address to you, will you kindly send "MPM" to me c/o Ernest L. Martin, 3741 So. Fox St., Englewood, Colorado.

Alva H. Meyer
Technical Consultant on Metal Fabrication

Wishes information

Gentlemen: On page 74 of METAL PRODUCTS MANUFACTURING magazine you give a photo credit to a concern Catalytic Combustion Corporation.

Can you give us the home address of this concern?

John C. Fleming
Incinomode, Inc.
Garland, Texas

Article on stainless steels

Gentlemen: In the January and February issues of the magazine entitled MPM we read with interest your article on How to Fabricate Stainless Steels. If it is possible, we would appreciate receiving six copies of this article.

They may be forwarded to the attention of the writer.

G. D. Hampton
American Steel & Wire Div.
United States Steel Corporation
Cleveland 13, Ohio

Wants reprints

Gentlemen: There are two articles and one advertisement appearing in your February, 1958 issue that appealed to us because this information would be invaluable to our representatives in discussing finishing problems. These are as follows:

Page 11 — "Chemical Prepaint Treatments for Metal Surfaces."
Page 18 — "Wyandotte Spray Cleaners."
Page 36 — "Infra-red Heating Does Many Jobs In The Metal Products Field."

If they are available, we would like to have 20 reprints of each of these. If there is any cost, please include a bill when sending these marked for my attention.

R. A. Drerup, Ass't. Manager
Industrial Division
The Lowe Brothers Co.
Dayton 2, Ohio

More on infra-red

Gentlemen: We were very much interested in your splendid article entitled, "Infra-red heating does many jobs in the metal products field" which appeared in the February issue of "MPM."

We are currently engaged in two research projects for the construction of appliances in which the use of infra-red heating is essential. One of these is a project of toasting the outside of sandwiches and heating the filling, the sandwich being packed in a transparent cellophane envelope. The other project is that of raising fifty or more metal discs to a temperature of 450°F. as quickly as possible. The metal discs are approximately 4" in diameter, ½" thick and weigh approximately 9 oz. They are made of an aluminum alloy and are stacked in piles 50 discs high when in the heating device.

We are looking forward to part two which is to appear next month with the hope that some of the practical applications which you will describe will contain suggestions helpful to us. We would also feel very much indebted to you if you could make any suggestions as to where we can obtain further information as to any research work that has been done which would be helpful to us. We are familiar with the Stewart Infra-Red devices and are in correspondence with that company.

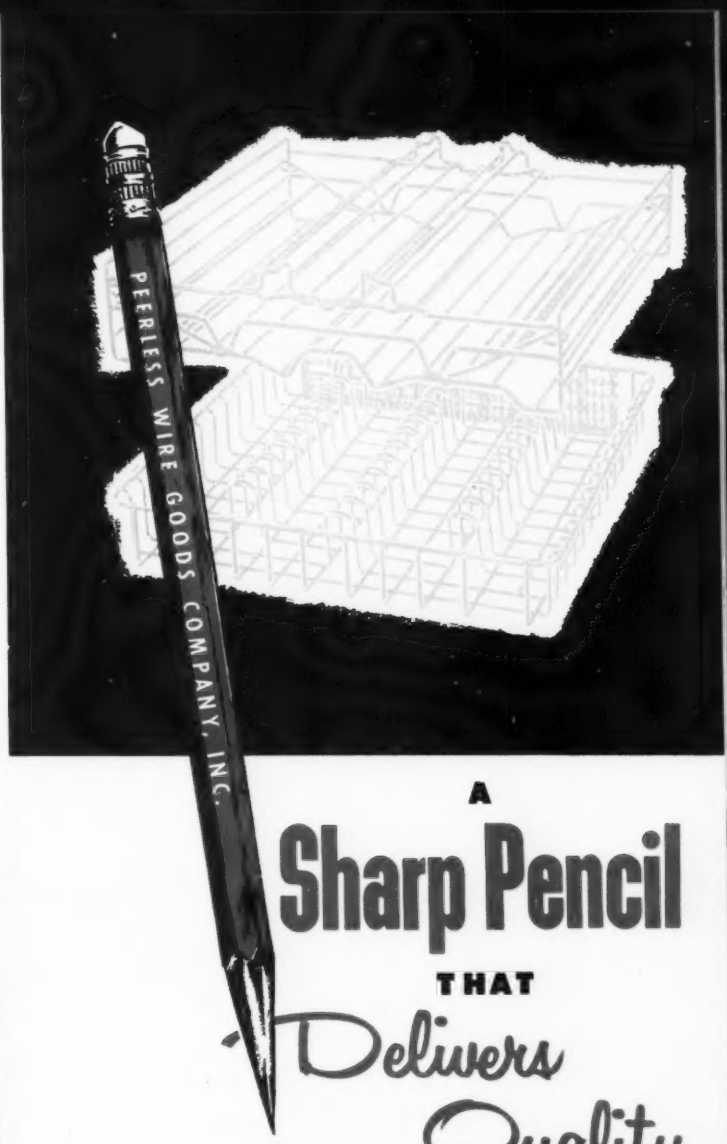
W. H. Rudolph
President
Savory Equipment, Inc.
Newark 5, N.J.

Wishes information

Gentlemen: Reading through the January issue of METAL PRODUCTS MANUFACTURING, we have come across an article describing the use of Half Second Butyrate formulation lacquer. We are interested in learning more about this material and would appreciate it if you would supply us the address of Construction Specialties so that we could contact Mr. E. C. Hallock.

Lionel Lamoureux, Works Manager
Appliance & T.V. Receiver Dept.
Canadian General Electric Company Limited
Montreal, Quebec

to Page 14 →



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Quality has a way of suffering when price is figured on wire goods because the margin between cost and quotation can be increased by sacrificing quality.

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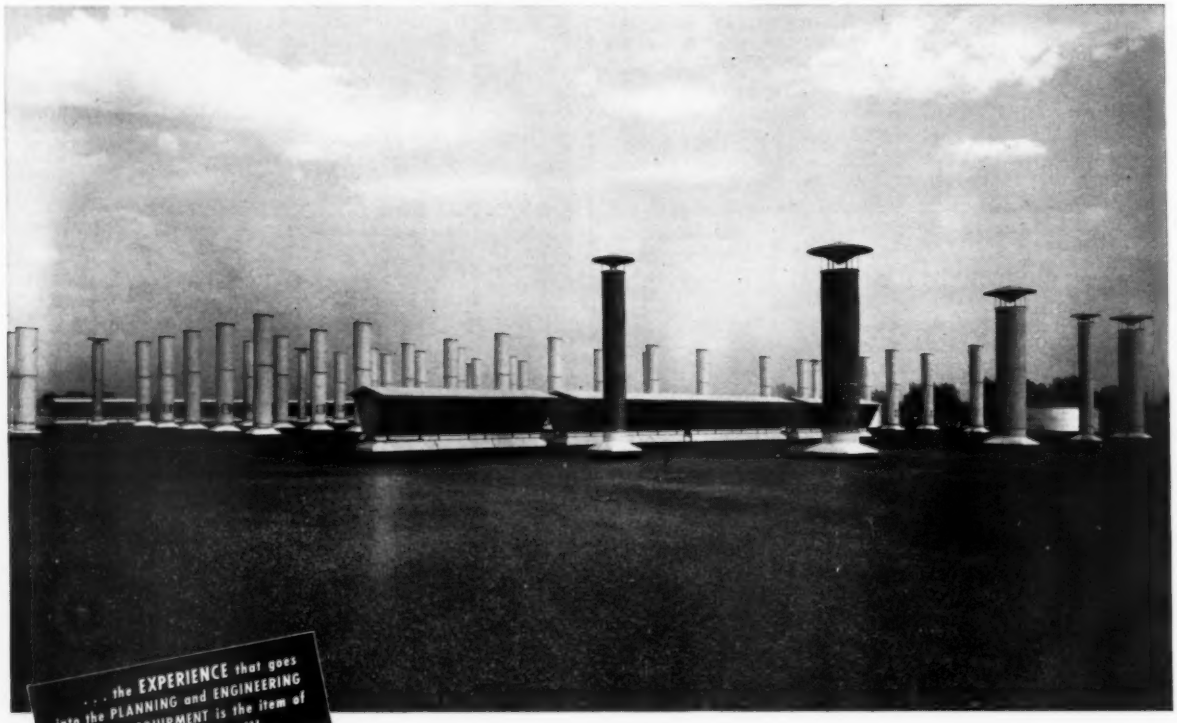
FINISHING SYSTEMS . . .



Air Intakes and Exhaust Stacks of Bonderizing Equipment, Spray Booths and Ovens of a Complete Mahon Finishing System Installed in the Lincoln-Mercury Plant, Wayne, Mich.

In the initial construction of the Lincoln-Mercury Plant at Wayne, Michigan, the Building Products Division of the Mahon Company supplied and erected the Steel Roof Deck, and the Insulated Aluminum Curtain Walls for the entire Plant, Powerhouse and Paint Storage Building.

Since this installation was completed in 1952, the Mahon Company has installed Six more similar installations for the Ford Motor Company in new plants across the country.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Conveyorized Finishing Systems; Metal Parts Washers, Metal Cleaning and Rust Proofing Machines, Conveyorized Cleaning and Pickling Machines; Dry-Off Ovens, Cooling Tunnels, Spray Booths, Electrostatic Spray Enclosures, Flow Coaters, Dip Coaters, and Finish Baking Ovens; Core Ovens, Heat Treating and Quenching Equipment for Aluminum and Magnesium, Dust and Fume Control Installations, and Many Other Units of Special Plant and Production Processing Equipment.

See Sweet's Plant Engineering File for Information and Representative Installations, or Write for Catalogue A-658

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Powered appliances for the homemaker lend willing help on many tasks—from sharpening knives to broiling chickens. And solid, ever-lustrous Superior Stainless lightens care for the life of each unit: *a wipe, and it's bright!* Superior Stainless Strip Steel is preferred by appliance manufacturers for dimensional accuracy; precisely as-specified composition, temper and finish; uniform ease of fabrication. • Let us have your requirements.
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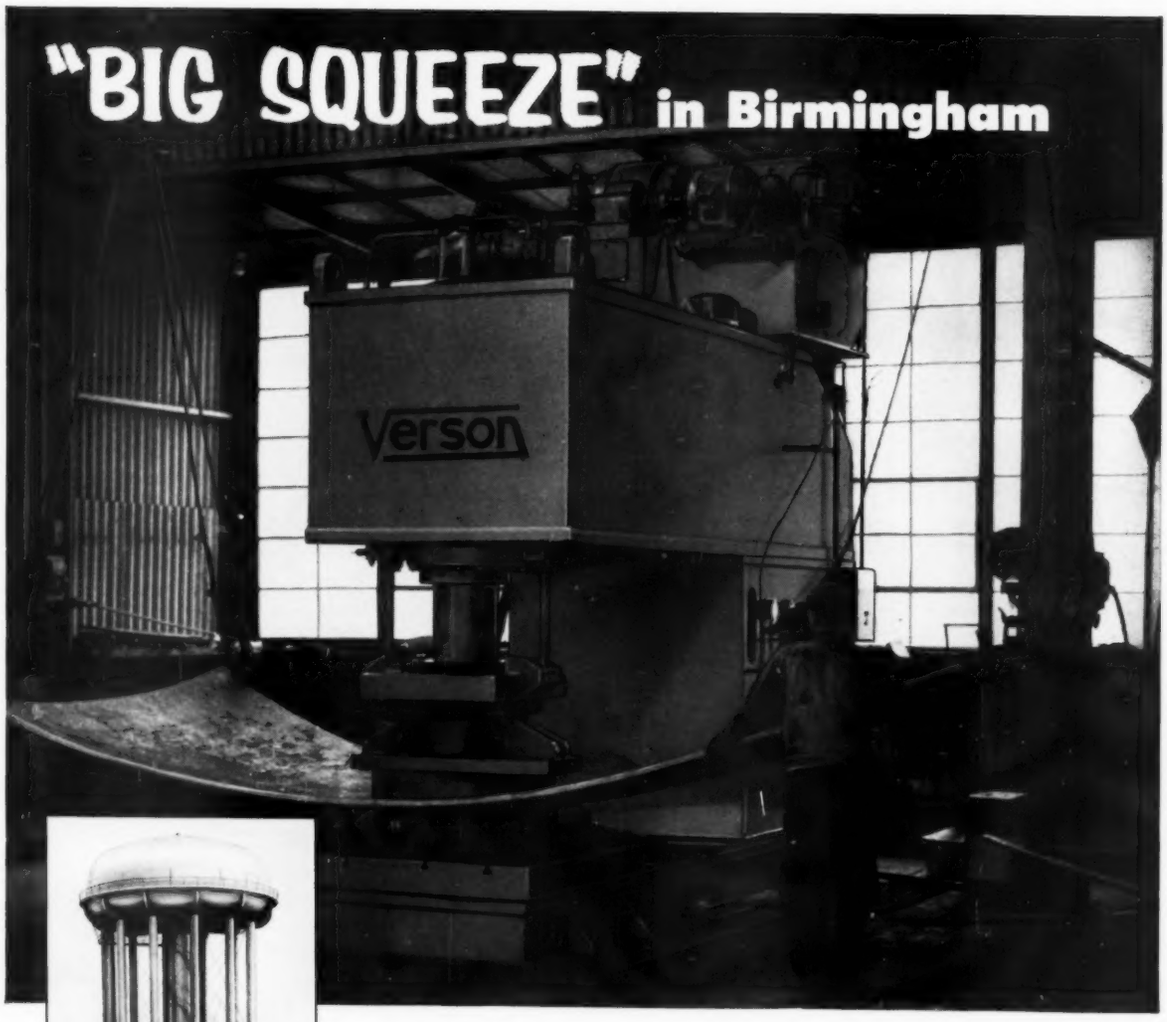
"BIG SQUEEZE" in Birmingham



200 ton Verson Press dishes steel plate for storage tanks at Hammond Iron Works

Do you put the "Big Squeeze" on metal? Here's how Hammond Iron Works does it at their Birmingham, Alabama, plant. This recently installed 200 ton Verson Hydraulic Flanging Press dishes heavy steel plate for the wide variety of storage tanks manufactured by Hammond.

Gap depth is 72" (from centerline of cylinders to back of frame), more than ample for a work piece such as this section for a radial cone elevated water tank. The press has a fast advance speed of 388" per minute; pressing speed, 38" per minute; and fast return speed, 520" per minute.

The down-acting cylinder has a 36" stroke; the bed liftout cylinder, a stroke of 18". Ram area is 30" x 30" and the bolster is 60" x 60".

Big job . . . small job . . . if it concerns the press forming of metals, come to Verson. Here a press is more than just a press . . . it's a production process, engineered and built to provide greater efficiency and production with higher profit potential. Put Verson's production know-how to work for you. Write or phone, today.

173

A Verson Press for every job from 60 tons up.

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ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

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INDUSTRY MEETINGS

DESIGN ENGINEERING

Design Engineering Show, International Amphitheater, Chicago, Ill., April 14-17, 1958.

TECHNICAL MEETING

American Welding Society's Annual Technical Meeting, Hotel Statler, St. Louis, Mo., April 14-18, 1958.

WELDING SOCIETY

American Welding Society's Annual Welding Show, Kiel Auditorium, St. Louis, Mo., April 15-17, 1958.

HOME LAUNDRY

American Home Laundry Manufacturers' Association's 42nd Annual Meeting, Boca Raton Hotel & Club, Boca Raton, Fla., April 20-22, 1958.

CERAMIC SOCIETY

American Ceramic Society's 60th Annual Meeting, Pittsburgh, Pa., April 27-May 1, 1958.

ARCHITECTURAL METAL

National Association of Architectural Metal Manufacturers' 20th Annual Convention, Shamrock-Hilton Hotel, Houston, Texas, April 27-May 2, 1958.

TOOL ENGINEERS

American Society of Tool Engineer's 26th Annual Meeting & Tool Show, Philadelphia Convention Center, Philadelphia, Pa., May 1-8, 1958.

AIR CONDITIONING

Air-Conditioning & Refrigeration Institute's Annual Meeting, The Homestead, Hot Springs, Va., May 4-7, 1958.

METAL EXPOSITION

American Society for Metals First Southwestern Metal Exposition and Congress, State Fair Grounds, Dallas, Texas, May 12-16, 1958.

OFFICE MANAGEMENT

National Office Management Association's International Conference and National Office Show, Conrad Hilton Hotel, Chicago, Ill., May 25-28, 1958.

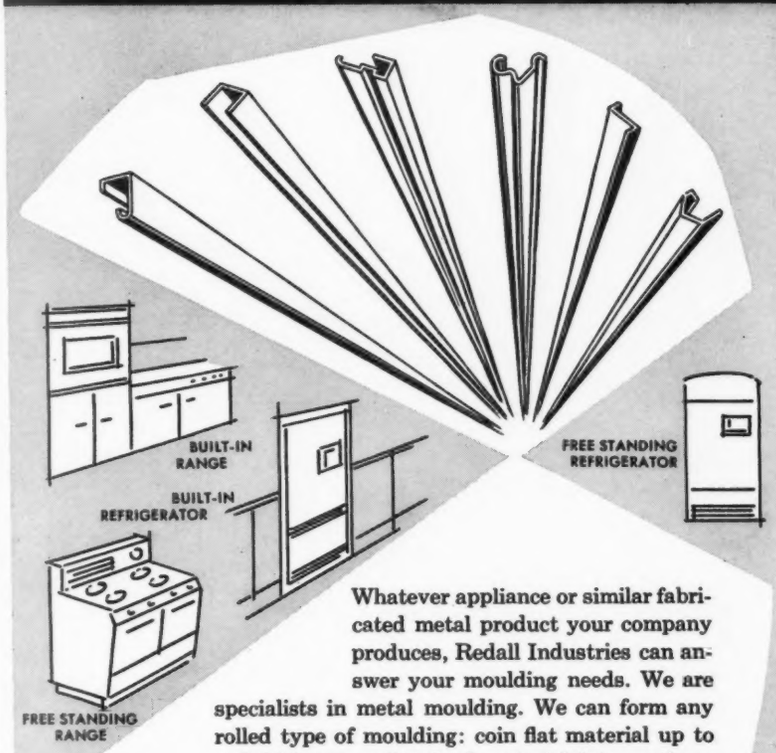
PACKAGING CONFERENCE

American Management Association's National Packaging Conference, Hotel Statler, New York City, May 26-28, 1958.

PACKAGING EXPOSITION

American Management Association's National Packaging Exposition, Coliseum, New York City, May 26-30, 1958.

metal mouldings of QUALITY for appliances of MODERN DESIGN



Whatever appliance or similar fabricated metal product your company produces, Redall Industries can answer your moulding needs. We are specialists in metal moulding. We can form any rolled type of moulding: coin flat material up to 1/16" thickness, roll coined material into sections, and roll patterns on metal. We have a wide variety of production mouldings to choose from or we can meet your requirements for custom designs.

In addition to having complete facilities for the production of metal mouldings Redall Industries provides facilities for assembly work, light stamping, and tool and die work.

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PRODUCTION AND CUSTOM MOULDINGS OF ALL TYPES

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LEXINGTON 1, MICHIGAN

3/26/58 — ATTENTION . . . Home Laundry Manufacturers . . . as this page goes to press in the last form of April MPM, we learned that the program originally released by the American Home Laundry Mfrs. Ass'n. for the Boca Raton meeting (see page 60) has been completely changed. You will receive a revised program direct from AHLMA headquarters. — Editors.

One coat does the wor f

AMAZING NEW

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DURACRON ALONE combines in a single finish superior adhesion, color and gloss retention, durability, flexibility and resistance to chemicals, grease, humidity, moisture, salt spray, stains and impact—for a wide variety of end uses.

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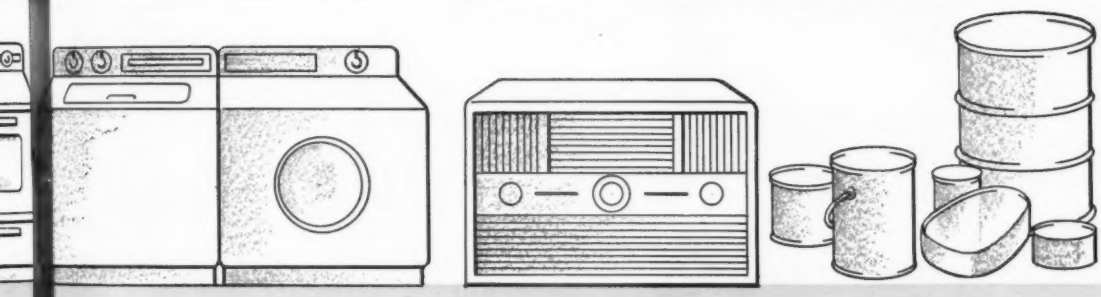
CRON

THERMO-SETTING ACRYLIC ENAMEL



Now . . . tailored to your finishing needs!

Today's biggest news in finishes is the development of amazing DURACRON in a variety of formulations for many end uses.

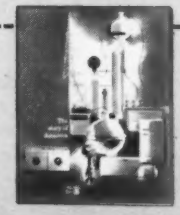
● **Since its introduction,** this revolutionary chemical composition has convincingly demonstrated its superiority to conventional baking enamels on many products.

● **DURACRON has proved** that *one coat effectively does the work of the conventional two-coat finishing system.* Its many outstanding advantages enhance the sales appeal and utility of the products on which it is used.

● **Now . . . DURACRON ENAMEL** is made available in a wide range of properties. It can be sprayed, dipped or roll-coated. It can be cured at lower temperatures. And it can be used either as a one-coat enamel or as a topcoat with various primers.

● **Mail the coupon below** for detailed information about DURACRON and learn what it can do for you. Investigate the possibility of one-coat application to reduce production costs.

Mail this coupon today for new book



Pittsburgh Plate Glass Company, Industrial Finishes Div., 1 Gateway Center, Pittsburgh, Pa.

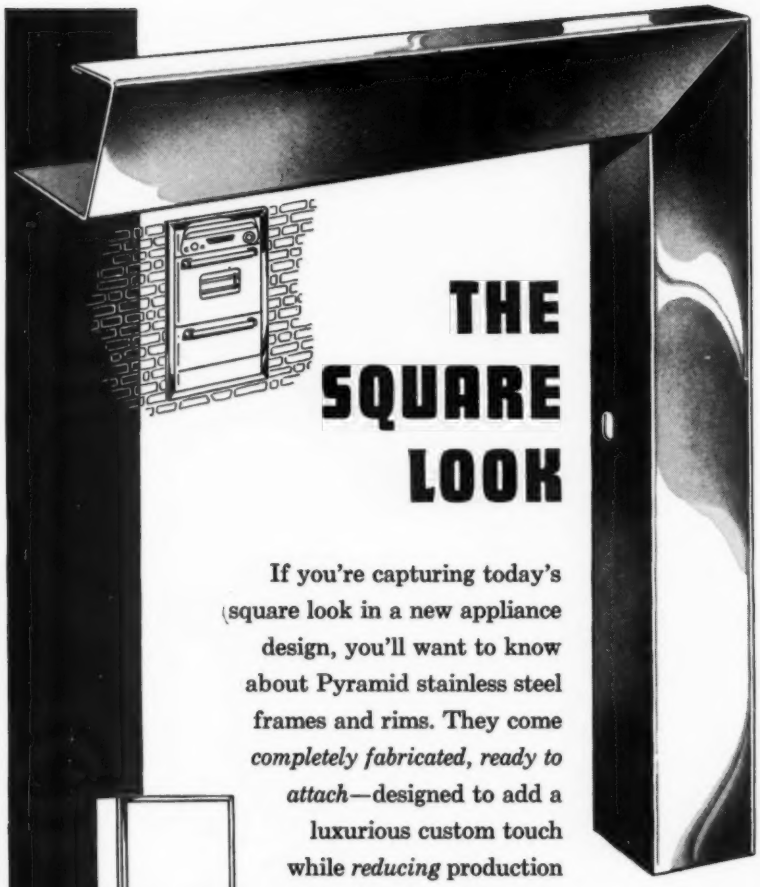
Gentlemen: Please send me your new brochure, containing information about DURACRON Thermo-Setting Acrylic Enamel, and how it reduces manufacturing costs.

Name_____

Company_____

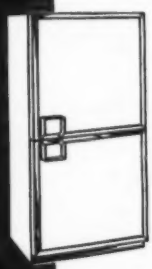
Address_____

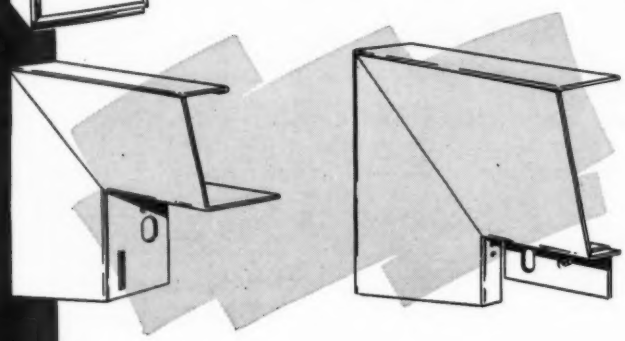
City_____ **County**_____ **State**_____



THE SQUARE LOOK

If you're capturing today's square look in a new appliance design, you'll want to know about Pyramid stainless steel frames and rims. They come *completely fabricated, ready to attach*—designed to add a luxurious custom touch while *reducing* production costs. We'll be more than pleased to furnish full details and samples.





Simple additions to standard toolings often custom tailor standard shapes at little tool cost.

Write today for free "Plan Book of Metal Mouldings"

Pyramid Mouldings Inc.

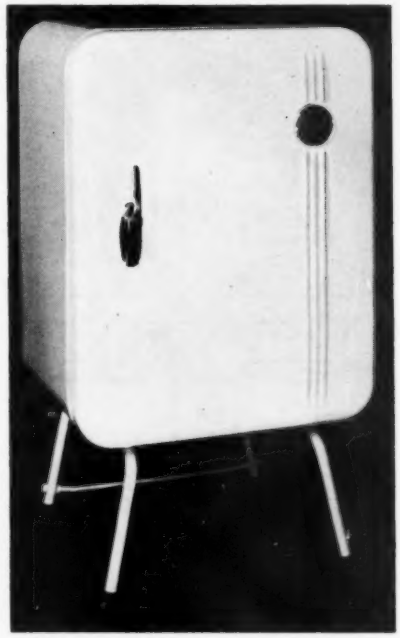
5365 WEST ARMSTRONG AVE., CHICAGO 46, ILL.
NEW YORK ... CALIFORNIA

Editor's Mail

→ *from Page 7*

Hands across the sea

Gentlemen: Your letter of 20th, inst. was greatly appreciated and I have pleasure in enclosing two photographs of our new Coronet "baby" fridge. You will note, though small, it holds a great deal. We also supply a stand with it for those who have no adequate shelf or suitable cabinet on which to place it in the kitchen.



Unfortunately we have no picture of Mr. Purley actually with the refrigerator but I trust one or other of the enclosed will be satisfactory.

Your good wishes are heartily reciprocated. Whenever you, or any of your associates, are in England we shall be most pleased to welcome you to Bognor Regis.

Please send me a copy of the issue in which your mention appears. I look forward very much to reading it.

R. E. Stevens,
Lec Refrigeration Limited
Bognor Regis, Sussex

Infra-red heating

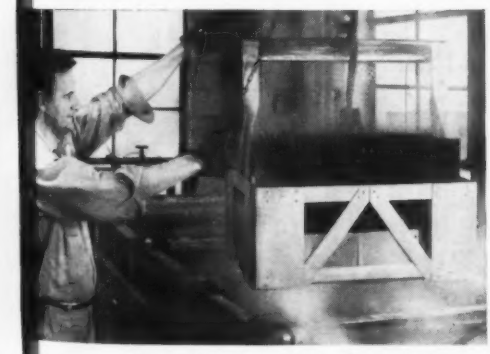
Gentlemen: This article on infra-red heating applications in industry in the February, 1958 issue is of interest to me. Would it be possible to send a reprint of the article and the concluding article? If so, it would be appreciated very much.

We are designers and manufacturers of finishing systems, and are representatives of Fostoria Pressed Steel Corporation in the Southern California area.

R. D. Turgeon, Jr.
Sales Engineer
Sprayking, Inc.
Los Angeles 12, Calif.

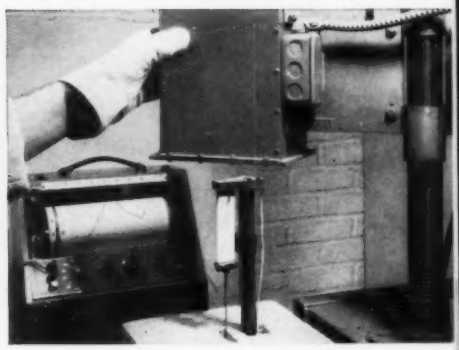
to Page 54 →

World's most modern porcelain enameling furnace (but in miniature) permits Ferro engineers to test new frit formulations and firing techniques.



New methods of metal preparation, including a "spray pickling" process, are studied and tested.

Spraying, dipping — even electrostatic spraying — are checked under actual production conditions.



Seventy-two different instruments help in final testing, assure that the finish fits the job.

INCUBATOR for new ideas in porcelain enameling

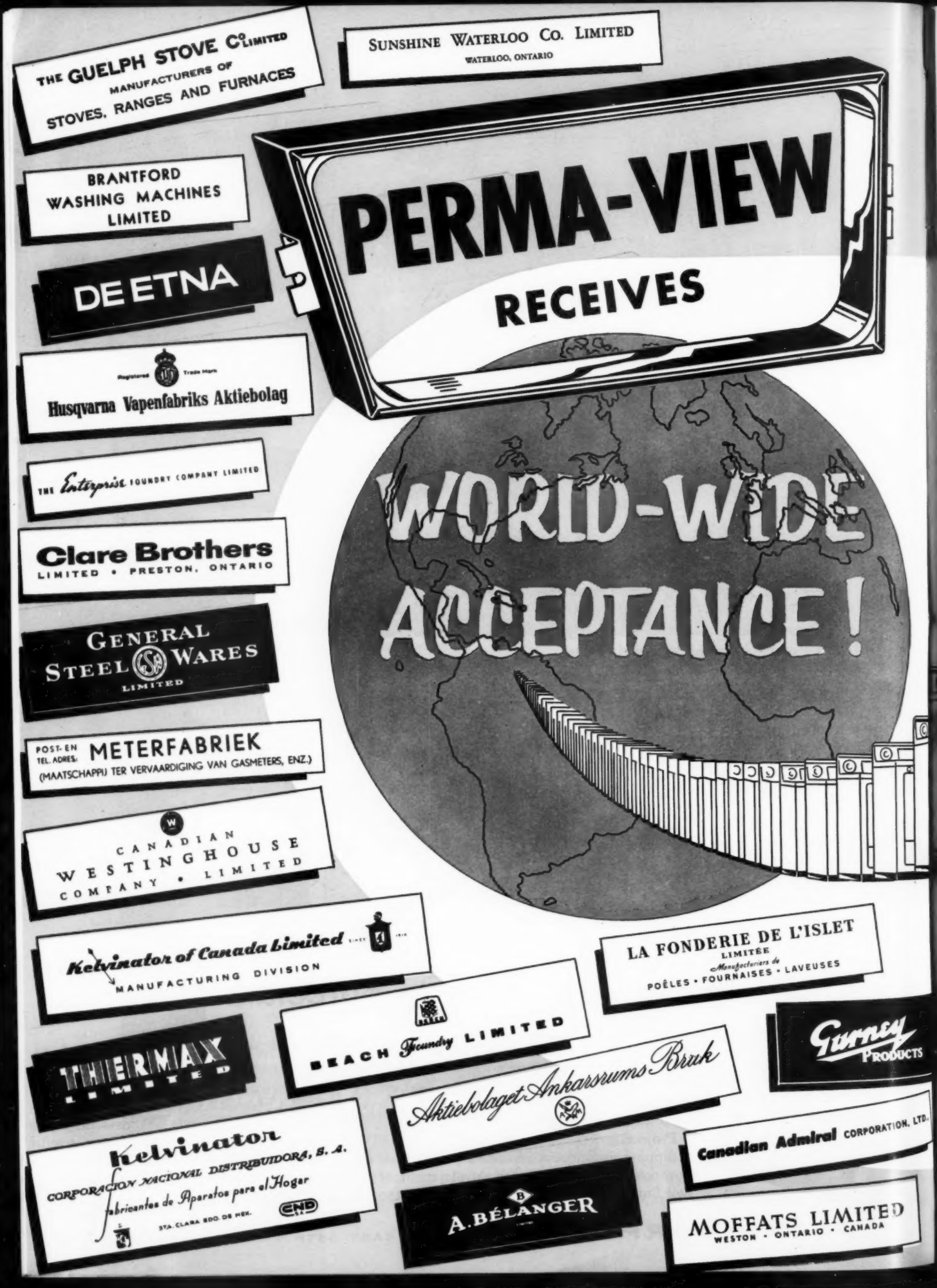
FERRO®

The answer you're seeking may be, even now, "in the lab" at Ferro. And not just in the test tube stage, but being tested under carefully controlled *production* conditions so it will be *right* when you get it.

Projects now under way range from adapting a dipping groundcoat enamel for automatic flow-coat operations to the development of new finishes that could well revolutionize the industry in the next few years or decade.

All these facilities and skilled craftsmen (there are 35 of them including physicists and chemists as well as ceramic engineers) are here for two purposes only: To make porcelain enamel *ever more useful* as a finish for industry; and to make porcelain enameling *profitable* for those in the business.

FERRO CORPORATION 4150 EAST 56TH ST. • CLEVELAND 5, OHIO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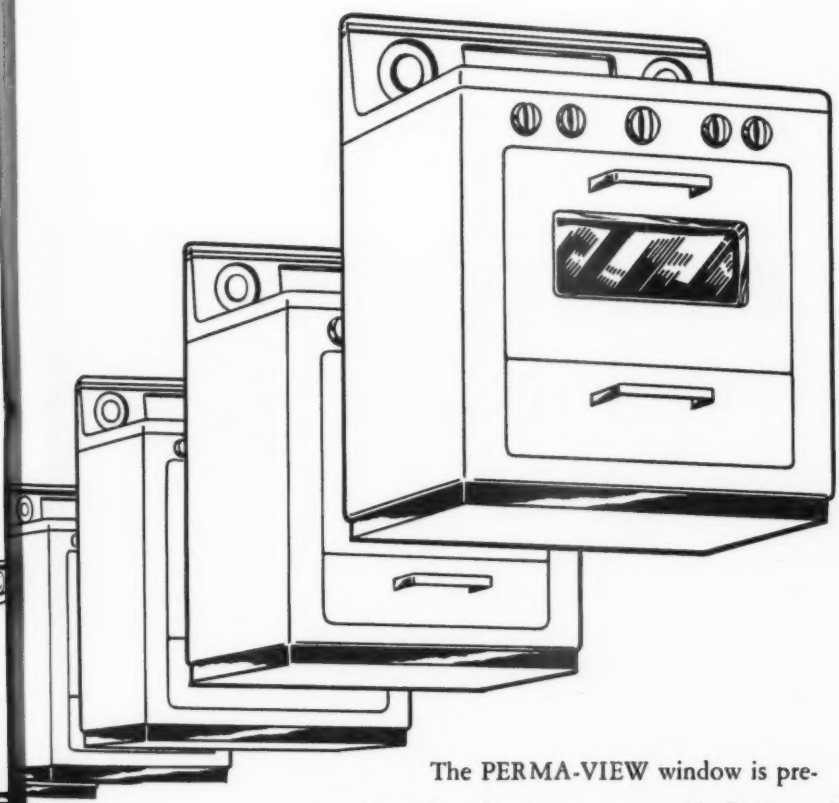
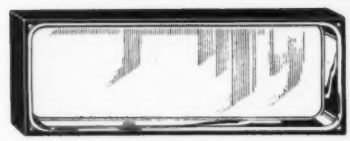
A. BÉLANGER
MOFFATS LIMITED
WESTON • ONTARIO • CANADA

PERMA-VIEW oven door windows are fast becoming standard with leading range manufacturers in the United States, from Coast to Coast. Now, leading manufacturers in other countries are learning the sales advantages of the PERMA-VIEW "No-Fog" window too.

(Accompanying names and trademarks represent some of the present users outside the United States.)





RECTANGULAR

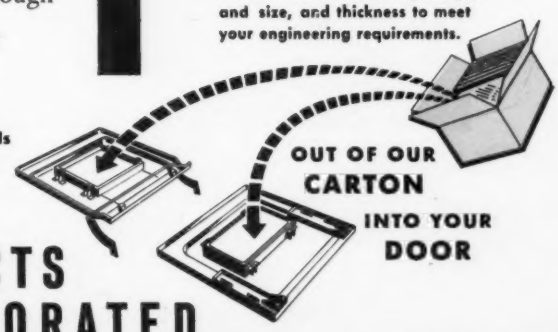
ROUND

SQUARE

TRAPEZOID

The PERMA-VIEW window is pre-engineered, and comes to you ready for immediate installation in your range. "Out of our carton into your door." With PERMA-VIEW you get "a window you can see through always." Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on the ease and economy of adding this sales feature to your new ranges.

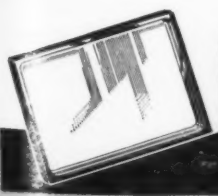
We can manufacture any shape, and size, and thickness to meet your engineering requirements.



Alternate methods of attachment may be used

OUT OF OUR CARTON

INTO YOUR DOOR



MILLS PRODUCTS INCORPORATED

1015 WEST MAPLE ROAD • WALLED LAKE, MICHIGAN

GENUINE PERMA-VIEW NON-FOG

For Increased Production, Lowered Costs . . .

SPECIFY YOUNGSTOWN SHEETS AND STRIP

Batteries of modern forming presses are busy working around-the-clock to keep today's auto body production in high gear. In order to maintain their reputations for high product quality, leading producers specify Youngstown Sheets and Strip because they're a blend of the proper combination of tensile strength, surface finish, flatness and ductility. Our satisfied customers tell us they get:

- Increased Over-all Production
- Lowered Reject Rates
- Faster and More Accurate Forming
- Decreased Fabrication and Die Costs

Why not make Youngstown your sheet and strip specification for improved product quality—and lowered production costs?

Youngstown Sheets and Strip are known throughout the stamping and drawing industry for their uniform high quality. Rigid quality control over every phase of their production provides a steel to meet **your** exact specifications. Since Youngstown's best—why settle for less?

For additional information or metallurgical field assistance, call or write your nearest Youngstown District Sales Office—or write directly to our Home Office.

Photo Courtesy of General Motors Corp.

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

COLD ROLLED SHEETS
QUALITY YOUNGSTOWN SERVICE
AND STRIP

THE finish LINE

EDITOR'S NOTE:

Certainly no one is in better position than Helen Kendall to counsel with our manufacturer readers on a problem such as service. She has spent years in close study of the habits, wishes and preferences of the homemaker who buys, uses and judges the home appliances. We suggest this editorial for top management reading and for *action*.

MY LAST WORD ON APPLIANCE SERVICE

A GUEST EDITORIAL by Helen W. Kendall

For some time, now, Editor Dana Chase has been urging me to air some of my views on the problems of appliance service — a subject which to me seems pretty hackneyed. Truthfully, I didn't want to do so, for in light of the many things I have said and written about appliance service in the past, this seemed like kicking a dead horse. Moreover, I am not sure that I have a single new thought to offer. However, my present association with Easy Laundry Appliances has given me an opportunity to talk with innumerable people about it — appliance users, largely, but I have had session after session, too, with service people themselves, and, of course, I have discussed service problems rather freely with Easy management. On this basis, then, here's what I have to say, straight from the shoulder.

We all know that there are four major divisions of responsibility in servicing appliances: the manufacturer, the distributor, the dealer, and last, but not least, the consumer. Obviously, a break-down in any one of these four divisions can be a direct traceable cause for poor service, but it seems to me that there are just two real contributing factors for these break-downs. Factor number one is CARELESSNESS. Factor number two is POOR COMMUNICATION. Let's take these two contributing factors in order of their importance to efficient appliance service.

CARELESSNESS

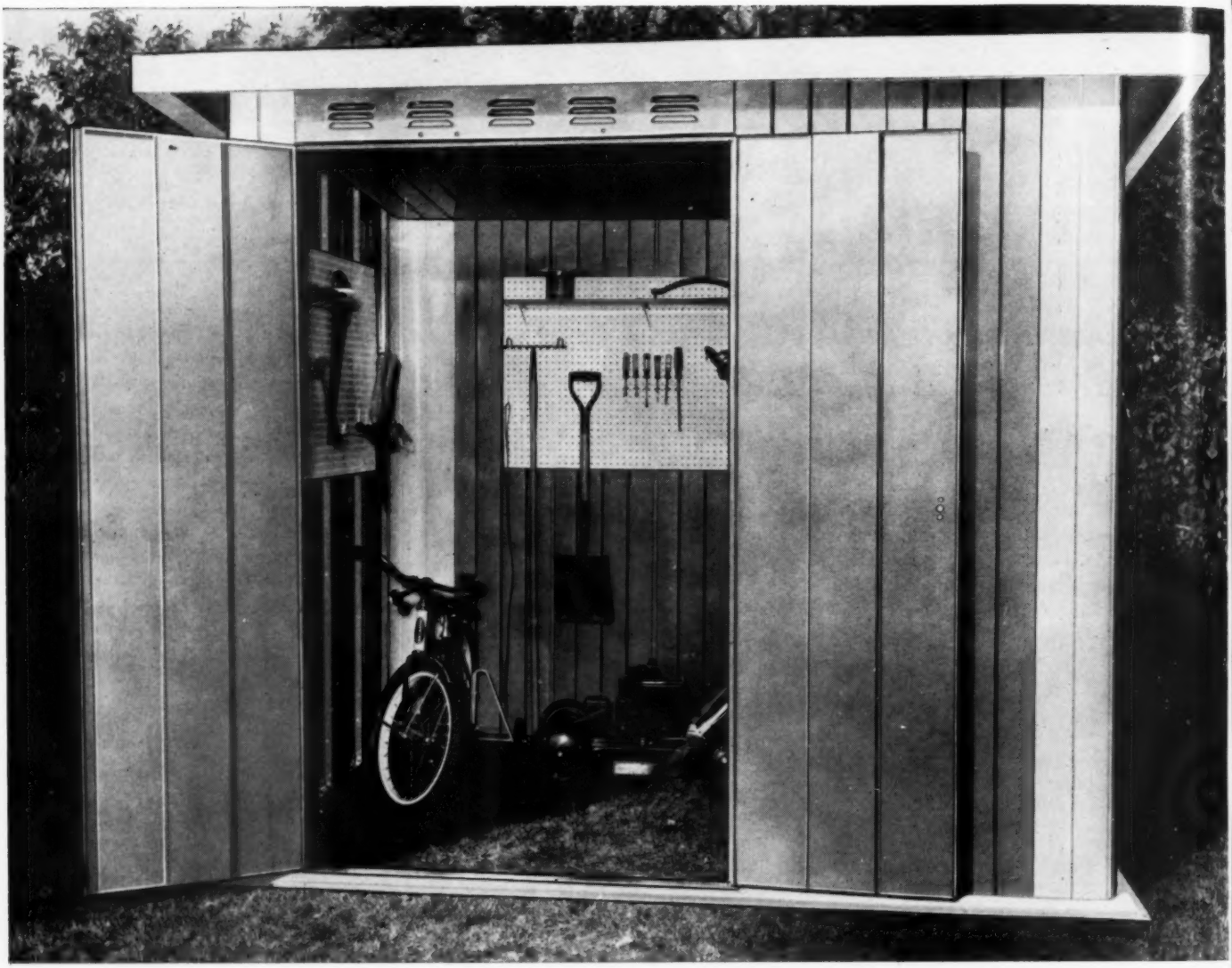
I do not try to tell manufacturers, distributors or dealers how to manage their business operations. But I do know that carelessness must be combated. Disinterest in the quality of one's work seems to run rampant in many manufacturing, shipping and retailing operations. I believe that more pride of accomplishment needs to be instilled at a management level and must find its way down through any organization. This is an important point. Homemakers tell me that they are much more interested in the efficient and continued operation of their appliances than they are in stylish innovations which will be obsoleted in a few years. So while this sounds very trite indeed, it behooves manufacturers to push harder to see that their appliances are well-designed, well-engineered and well-constructed. This need for quality goes right on down the line — not only in manufacturing but in shipping, selling and installing. If anywhere near proper control is maintained in each of these areas of responsibility, a great many service problems are nipped at the source.

Carelessness on the part of the consumer, herself, is a real sticky problem, and I suppose it always will be. In her behalf, though, I have often wished that someone would outline just what the responsibilities of the consumer are. All I have in mind are a few simple rules to follow in describing need for service. Could it be that service men are assuming that women are just too stupid to recognize failure in an appliance and make no attempt to follow her? And I am afraid we will have to admit that education of the consumer is not what it should be. Instruction manuals are a lot less than perfect, and it is entirely possible that manufacturers are not taking their full share of responsibility in bringing proper use information to the buyer. Nothing but vigilance and more and more education can eliminate uncomfortable situations here.

POOR COMMUNICATION

What I have to say on this subject may well be prompted by personal experience and grievance. What it gets down to is this. Service managers seem to pay absolutely no attention to the story told by the user in reporting failure. (I say this with apologies to two service outfits who serve me excellently.) I honestly believe that most women are accepting the fact that appliances cannot be expected to run on and on forever without service and that when they are out of warranty, the service must be paid for. And I believe that, by and large, they are willing to pay reasonable charges when the service is prompt and efficient. But they do resent being ignored. Too often when the technician arrives at the home of Mrs. Jones, he has no idea of the specific nature of the appliance malfunction. Or he came equipped to handle an entirely different type of malfunction than the one which actually exists. There was a strange and baffling failure of communication between the service manager who took Mrs. Jones' call and the technician sent out to remedy the trouble. I see no reason why a situation like this could not be corrected at least to some degree, to the good of all concerned, including the manufacturer who, in the final analysis, is the one who gets the blame.

I cannot claim to have a panacea for the difficulties of appliance service, but I will make one final sweeping statement on the subject. If an honest effort is made to let efficiency and understanding take the place of carelessness and misunderstanding in all four areas of appliance service responsibility, the least that can occur is a more efficient utilization of everyone's time. Since time is money, need I say more.



"WEIRZIN® ARRESTS CREEPING CORROSION,"

SAYS CHIEF ENGINEER OF GRAND SHEET METAL PRODUCTS COMPANY, MELROSE PARK, ILL.

"Especially designed to withstand wind, weather, fire and rough handling." That's the manufacturer's description of a Grand Handy House. Metal used? Weirzin.

But listen to what else Grand Sheet Metal Products Company has to say about Weirzin electrolytic zinc-coated steel, as used in their outdoor storage-shelter-utility Handy Houses. From Chief Engineer Edward Rawson:

> "Weirzin material provides a very good surface for maximum paint adherence, which is most important for an outdoor application such as ours.
>
> "High corrosion resistance is also of the utmost importance. Weirzin answers this requirement very well since it arrests any creeping of corrosion where the surface may become scratched or abraded in service. In other words, the corrosion will not tend to spread beyond the damaged area."

What about your products? Have you considered lately how they can be improved economically? Send for free brochure on Weirzin for both outdoor and indoor use. Write Weirton Steel Company, Department R-15, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

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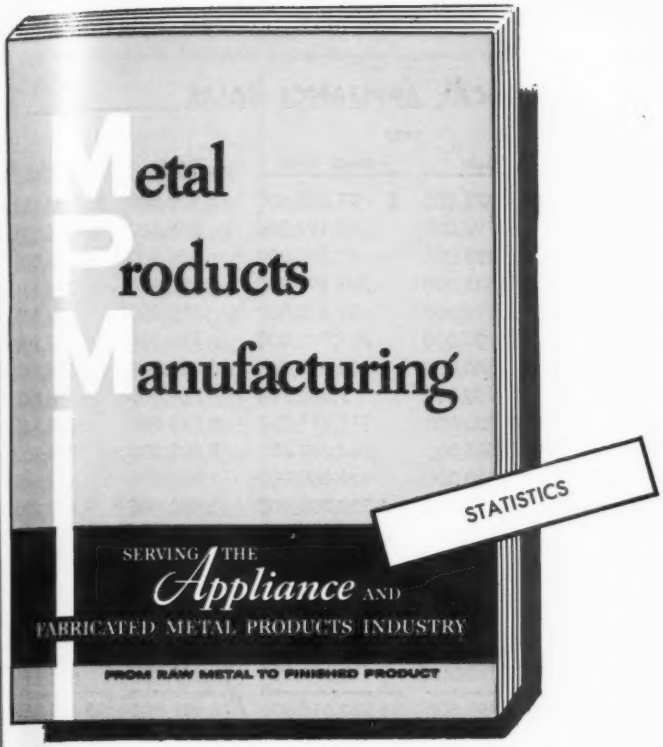


The Fifth Annual MPM Market and Statistical Review indicates moderate declines in factory shipments and/or sales of most appliances and metal products for 1957. Room air conditioners have continued to increase in sales, however. The overall predicted increase of 1957 shipments and sales over 1956 never materialized. Nevertheless, figures for most products for 1957 ranked third behind the peak years of 1955 and 1956, and well ahead of 1954. Predictions for several categories are that 1958 will rise above 1957 in sales. Only a few major production items show gains over 1957 for the first months of 1958. The year 1957 was a good year when compared with earlier years.

Fifth annual market and statistical review of the appliance and fabricated metal products manufacturing field

SUMMARY — FACTORY SHIPMENTS AND/OR SALES

(Typical segments only — data not available for many groups)

Product	Units Shipped			
	1954	1955	1956	1957
Air Conditioners, room	1,230,000	1,400,000	1,770,000	1,812,000
Electrical Appliances	62,234,000	70,750,000	79,942,000	69,303,000
Cooking & Heating Equipment (non electric)	8,967,606	11,081,857	10,669,626	8,984,700
Home Laundry Equipment (domestic only)	4,474,168	5,702,859	6,227,000	5,067,690
Plumbing Ware	5,841,017	6,594,644	6,001,302	4,546,000
Steel Kitchen Cabinets	3,372,000	4,046,000	3,641,000	2,490,000
Vacuum Cleaners	2,658,136	3,270,441	3,721,870	3,190,172
TOTAL UNITS	88,776,927	102,845,801	111,972,802	98,393,562

ELECTRICAL APPLIANCE SALES

Product	1954 Units	1954 Retail Value	1955 Units	1955 Retail Value	1956 Units	1956 Retail Value	Units
Coffee Makers	3,450,000	$ 68,674,500	3,675,000	$ 71,662,500	5,100,000	$ 98,685,00	4,400,0
Dehumidifiers	76,000	10,260,000	96,000	12,192,000	275,000	36,025,00	225,0
Dishwashers	215,000	64,500,000	295,000	90,270,000	400,000	116,000,00	390,0
Fans	6,735,000	251,116,500	5,585,000	203,392,000	6,590,000	246,501,00	5,293,0
Food Waste Disposers	400,000	47,980,000	520,000	59,800,000	590,000	64,900,00	550,0
Freezers	990,000	391,425,000	1,100,000	439,945,000	975,000	380,200,00	925,0
Heaters	1,330,000	34,232,500	3,360,000	100,227,000	3,622,000	104,248,00	3,710,0
Hotplates	710,000	5,928,500	950,000	7,362,500	760,000	6,042,00	660,0
Irons	6,583,300	95,062,300	7,930,000	112,871,000	8,715,000	122,743,50	7,635,0
Radios	6,276,000	188,787,400	7,665,000	244,609,600	9,200,000	293,100,00	9,800,0
Ranges	1,350,000	353,700,000	1,600,000	423,800,000	1,585,000	412,645,00	1,365,0
Refrigerators	3,600,000	1,095,865,000	4,200,000	1,323,000,000	3,700,000	1,202,500,00	3,350,0
Television	7,346,700	1,689,741,000	7,756,500	1,745,212,000	7,200,000	1,368,000,00	6,500,0
Toasters	3,110,000	52,226,600	3,565,000	60,242,500	3,930,000	69,592,70	4,000,0
Waffle Irons	928,000	17,354,000	995,000	18,905,000	965,000	19,250,00	895,0
Water Heaters	800,000	101,337,500	900,000	103,500,000	870,000	100,050,00	800,0
Water Systems	728,000	123,400,000	788,000	130,000,000	775,000	120,125,00	750,0
Other Small Appliances	17,256,000	383,771,700	19,440,000	419,841,200	23,875,000	421,744,00	26,055,0
Total	62,234,000	$4,989,345,000	70,750,500	$5,580,015,800	79,942,000	$5,191,351,20	69,303,0

*Including Blenders, Deep Fat Fryers, Floor Polishers, Food Mixers, Shavers, Broilers, Clocks.
Source: Electrical Merchandising.

VACUUM CLEANERS

Product	1954 Units	1954 Estimated Retail Value	1955 Units	1955 Estimated Retail Value	1956 Units	1956 Estimated Retail Value	1957 Units	1957 Estimated Retail Value
Vacuum Cleaners	2,658,136	$251,858,400	3,270,441	$307,421,454	3,721,870	$353,577,650	3,190,172	$302,000,000

Source: Vacuum Cleaner Manufacturers' Assn. (Retail value estimated by MPM)

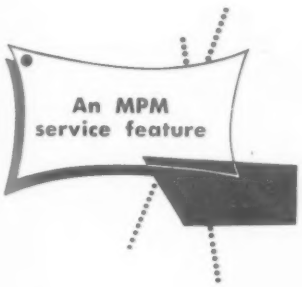
COOKING AND HEATING EQUIPMENT — NON ELECTR

Product	1953 Units Shipped	1953 Value	1954 Units Shipped	1954 Value	1955 Units Shipped	1955 Value	Units Shi
Cooking Stoves & Ranges	2,385,983	$205,819,000	2,207,489	$182,743,700	2,509,036	$224,277,00	2,276,90
Gas, total	2,097,462		1,967,113		2,269,673		2,069,
Bungalow and combination Ranges, total	87,853		63,206		61,255		60,
Coal & Wood	83,062		67,897		69,851		58,
Kerosene	117,606		109,273		108,257		88,
Domestic Heating Stoves	3,278,473	84,649,000	2,278,661	61,002,400	3,017,748	75,659,00	3,040,99
Floor & Wall Furnaces	551,614	36,198,000	539,894	31,063,100	614,584	39,121,00	491,93
Water Heaters	2,183,000	114,607,500	2,281,100	119,757,800	2,884,104	154,603,00	2,933,91
Oil Burners	579,696	58,320,000	528,500	56,062,300	650,241	59,693,00	571,10
Residential	540,774		494,259		609,639	44,668,00	531
Commercial & Industrial	38,922		34,321		40,602	15,025,00	39
Warm Air Furnaces	996,603	197,275,000	1,131,882	205,895,200	1,406,144	263,865,00	1,354,77
Total	9,975,369	$696,868,500	8,967,606	$656,524,500	11,081,857	$817,218,00	0,669,62

Source: Gas Appliance Manufacturers' Assn. and Facts for Industry.

1957

Units	Retail Value
4,400,000	$ 85,850,000
225,000	26,100,000
390,000	104,250,000
5,293,000	191,097,000
550,000	49,473,000
925,000	346,875,000
3,710,000	108,448,000
660,000	5,247,000
7,635,000	117,868,000
9,800,000	322,700,000
1,365,000	360,775,000
3,350,000	1,072,000,000
6,500,000	1,235,000,000
4,000,000	71,874,000
895,000	17,855,000
800,000	84,000,000
750,000	112,500,000
26,055,000	449,486,000
69,303,000	$4,761,398,000



HOME LAUNDRY EQUIPMENT

1957

Product	Units	Value
Domestic		
Washer-Dryer Machines	175,841	$ 58,000,000
Washing Machines	3,589,576	845,000,000
Ironing Machines	41,631	8,600,000
Dryers	1,260,642	276,000,000
Total	5,067,690	$1,187,600,000
Export totals unavailable		

1956

Product	Units	Value
Domestic		
Washer-Dryer Machines	102,406	$ 36,000,000
Washers	4,344,848	1,020,000,000
Dryers	1,499,304	328,000,000
Ironers	58,493	12,200,000
Total	6,005,051	$1,396,200,000
Export totals unavailable		

1955

Product	Units	Value
Domestic		
Washing Machines	4,236,555	$ 997,678,503
Ironing Machines	81,910	17,283,010
Dryers	1,384,394	305,082,774
Total	5,702,859	$1,320,044,287
Export totals unavailable		

1954

Product	Units	Value
Domestic		
Washing Machines	3,490,212	$ 807,781,875
Ironing Machines	86,205	17,844,435
Dryers	897,751	209,290,171
Total	4,474,168	$1,034,916,481
Export totals unavailable		

Source: American Home Laundry Manufacturers' Assn.
Retail value estimated by MPM

ELECTRIC

1956		1957	
Units Shipped	Value	Units Shipped	Value
2,276,902	$217,603,000	1,935,000	$174,000,000
2,069,545		1,759,000	
60,767		40,000	
58,447		49,700	
88,143		87,000	
3,040,998	80,906,000	2,840,000	75,500,000
491,930	34,895,000	440,000	31,200,000
2,933,919	162,097,000	2,544,500	141,500,000
571,105	49,528,000	521,000	45,000,000
531,990	35,939,000	470,000	
39,115	13,589,000	51,000	
1,354,772	260,694,000	704,200	135,000,000
10,669,626	$805,723,000	8,984,700	$602,200,000

STEEL KITCHEN CABINETS

1957	
Units Sold	2,490,000
Retail Value	$150,120,000
1956	
Units Sold	3,641,000
Retail Value	$188,395,000
1955	
Units Sold	4,046,000
Retail Value	$209,328,000
1954	
Units Sold	3,372,000
Retail Value	$174,440,000
1953	
Units Sold	3,441,000
Retail Value	$178,000,000

Source: Steel Kitchen Cabinet Manufacturers' Association.

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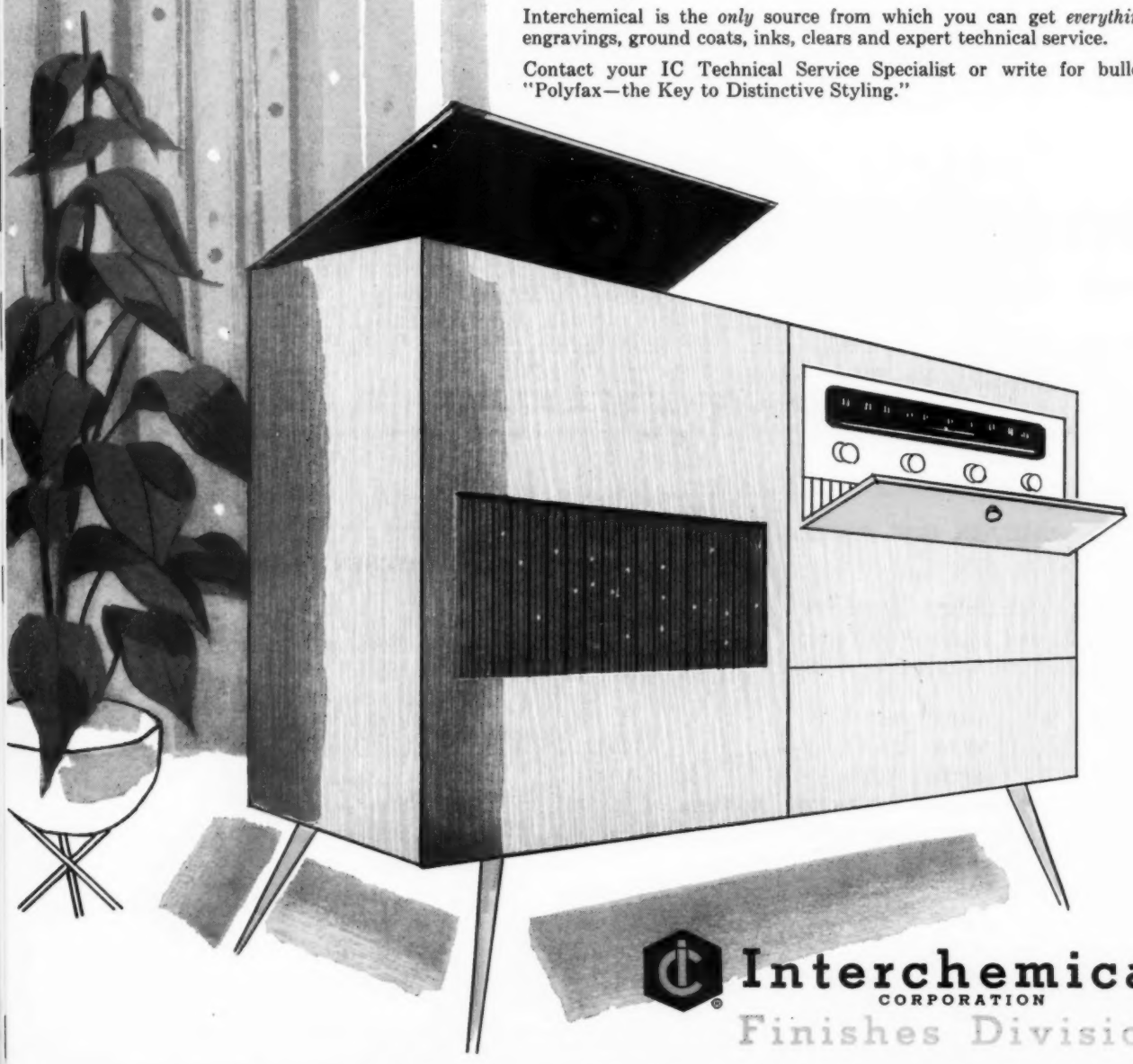


Interchemical
CORPORATION
Finishes Division

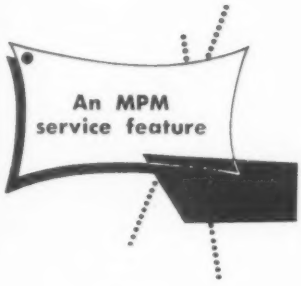
Headquarters Office: 224 McWhorter Street, Newark 5, N.J. Factories: Chicago, Ill. • Cincinnati, Ohio • Elizabeth, N.J. • Los Angeles, Cal. • Newark, N.J. • Mexico City, Mex. In Canada, this product is made by Aulcraft Paints Limited, Toronto, Ontario, and sold under its trademark. *IC and Polyfax are trademarks of Interchemical Corporation*

ROOM AIR CONDITIONERS

(Units Sold)

	1954	1955	1956	1957
Room Air-Conditioners..	1,218,000	1,270,000	1,600,000	1,592,000
Central Air-Conditioning	12,000	130,000	170,000	220,000
Total	1,230,000	1,400,000	1,770,000	1,812,000
Estimated Retail Value..	$419,298,000	$412,000,000	$495,400,000	$507,000,000

Source: Air-Conditioning and Refrigeration Institute
Retail value estimated by MPM.



ESTIMATED SALES ELECTRIC APPLIANCES 1958

(Including Exports)

	% Increase	Unit Increase	Total Units Estimated 1958
Dehumidifiers	+16.9	38,000	263,000
Dishwashers	+28.2	110,000	500,000
Food Waste Disposers	+ 2.4	13,000	563,000
Farm and Home Freezers	+ 2.7	25,000	950,000
Ranges:			
Standard	+ 5.1	48,000	988,000
Built-Ins	+11.8	50,000	475,000
Total	+ 7.2	98,000	1,463,000
Refrigerators	+ 4.5	150,000	3,500,000
Storage Water Heaters	+ 3.1	25,000	825,000

Source: NEMA

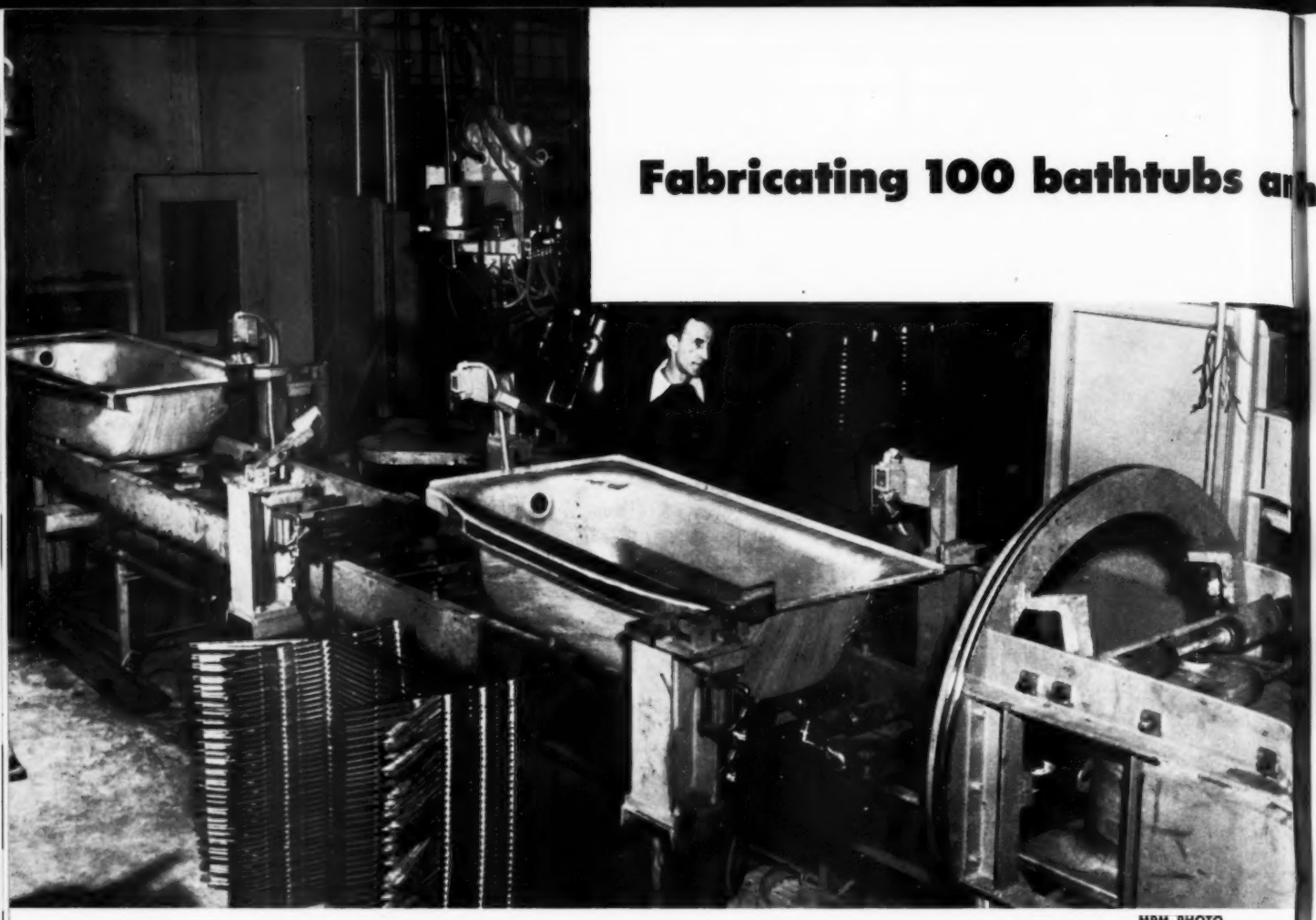
PLUMBING FIXTURES

(Units Shipped)

Product	1951	1952	1953	1954	1955	1956	1957
Lavatories							
Cast Iron	1,630,554	1,217,333	1,337,865	1,342,389	1,540,111	1,365,896	1,200,000
Steel	232,699	219,374	213,293	248,301	303,955	308,724	230,000
Total	1,863,253	1,436,707	1,551,158	1,590,690	1,844,066	1,674,620	1,430,000
Kitchen Sinks							
Cast Iron	1,212,586	1,000,835	1,022,101	1,008,873	1,060,086	921,358	560,000
Steel	1,196,859	1,015,328	1,096,584	1,169,121	1,363,971	1,318,076	730,000
Total	2,409,445	2,016,163	2,118,955	2,177,994	2,424,057	2,239,434	1,290,000
Bathtubs							
Cast Iron	1,504,471	1,355,181	1,434,881	1,507,786	1,678,467	1,485,503	1,230,000
Steel	413,477	454,500	456,199	564,547	648,054	601,745	596,000
Total	1,917,948	1,809,681	1,891,080	2,072,333	2,326,521	2,087,248	1,826,000

Source: Facts for Industry.

Fabricating 100 bathtubs an hour



MPM PHOTO

One of the "key" sequences in the production of pressed steel bathtubs at Briggs Mfg. The sanding booth is shown at left with a tub just having emerged. The tub in the foreground is being held by an automatic stop-release ready for the turn-over device. In right foreground this device is in the process of inverting a tub for the seam welding operation.

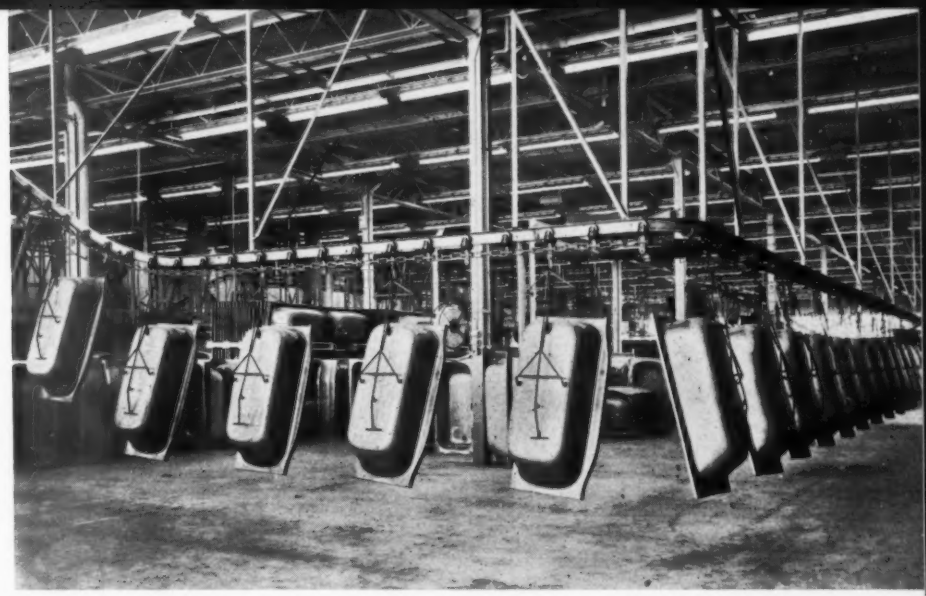
Fabricating line arranged to gain maximum production from each piece of equipment. Belt grinding and seam welding produce a flawless finished bathtub.

by John Sincere • TECHNICAL EDITOR • IN COLLABORATION WITH *Arnold Kohler,* SENIOR VICE PRESIDENT & *Kenneth Muir,* FACTORY MANAGER.

MPM EXCLUSIVE FEATURE

Briggs Manufacturing Company manufactures a complete line of bathroom and kitchen plumbing ware as well as a complete line of industrial fixtures. The latter category of products just recently has been introduced by Briggs and includes such fixtures as vitreous china drinking fountains, lavatories, water closets and urinals. Two vitreous china plants are operated by Briggs in addition to the new Warren, Michigan plant; one is in Abingdon, Illinois and one in Cincinnati, Ohio. A brass fitting plant is also operated in Cleveland, Ohio. The new single floor fabricating

hour at Briggs



Formed steel bathtubs are conveyed on a 1,144-ft. long 4-inch trolley conveyor, which runs from the press building through a metal washing machine and then winds through the metal shop. This plant has 13 trolley conveyors which total 8,736 ft. in length. PHOTO COURTESY LINK BELT

and enameling facility at Warren replaces a former multi story plant in Hamtramck. With the many improvements at the new plant, overall manufacturing efficiency has increased markedly. New equipment and better manufacturing methods make this operation one of the finest in the plumbing fixture industry.

The new plant has a working area of 320,000 square feet of which 60,000 square feet is devoted to the press room operations. Welding, finishing, storage, and packaging take up the remaining 260,000 square feet in the plant.

Production flow, based on proper location of equipment, was planned to gain maximum efficiency throughout the entire sequence of manufacturing. Conveyors play a large part in making this plan work. They provide in-process storage between fabrication and finishing operations so that an interruption in one area will not slow processing in the other.

Work areas bright, clean

Certainly one of the biggest factors in making this new plant at Briggs' highly efficient is the pleasant, light colored interior that is kept as clean as any plant could be. Lighting is excellent and simulates daylight on the darkest kind of day. Such conditions are conducive to good employee morale.

The press area is divided into two sections. On one side are the presses for production of the tubs and on the other are separate lines of presses for the sink and lavatory line and for small miscellaneous parts such as hanger brackets used to carry the bathtubs through the enameling furnaces. Raw steel, sufficient for several weeks production, is stored at one end of the press area. The entire double bay area is served by two 40 ton overhead cranes.

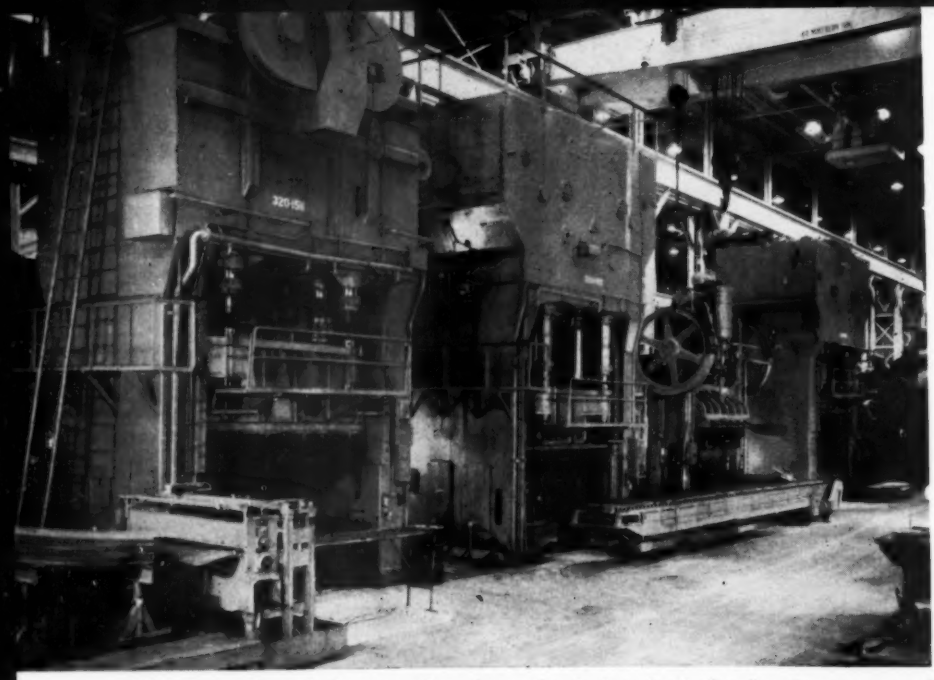
All of the steel used is .083″, which corresponds to 5 thousandths of an inch over 14 gauge. It is enameling grade steel supplied at a hardness of 24 Rockwell. Incoming shipments are subjected to frequent tests to insure uniform quality.

Roller level all steel

Before any deep drawing is done each sheet is sent through a roller leveler to flex the sheet. This is necessary to produce a good uniform draw. For a typical example a 65 in. by 74¾ in. sheet is drawn to a depth of 14⅞ in. in one operation to form a conventional 60 in. by 32 in. bathtub. Such a deep draw was made possible by the use of a 1600 ton capacity double action press and by using a specially prepared drawing compound.

Just before the sheet is fed to the first press it is passed through a pair of motor driven steel rolls that uniformly apply the paste-like drawing compound to the sheet. It then passes into the press by means of a mechanical feed unit for the drawing operation. The press is a double acting mechanical type with an 84 in. by 132 in. bed and a 76 in. shut height. The inner ram and the blank holder ram each exert 800 tons pressure against a hydraulic cushion. Some areas of the formed tub work harden to as much as 75 Rockwell. Because of the operating speed of the press, the quality of the steel, and the special drawing compound used, producing such a deep draw is no problem at Briggs. Important too, is the fact that the meehanite iron dies are designed with just the right radius and have hold-down beads to regulate the passage of the metal into the radii and the slope at the rear of the tub.

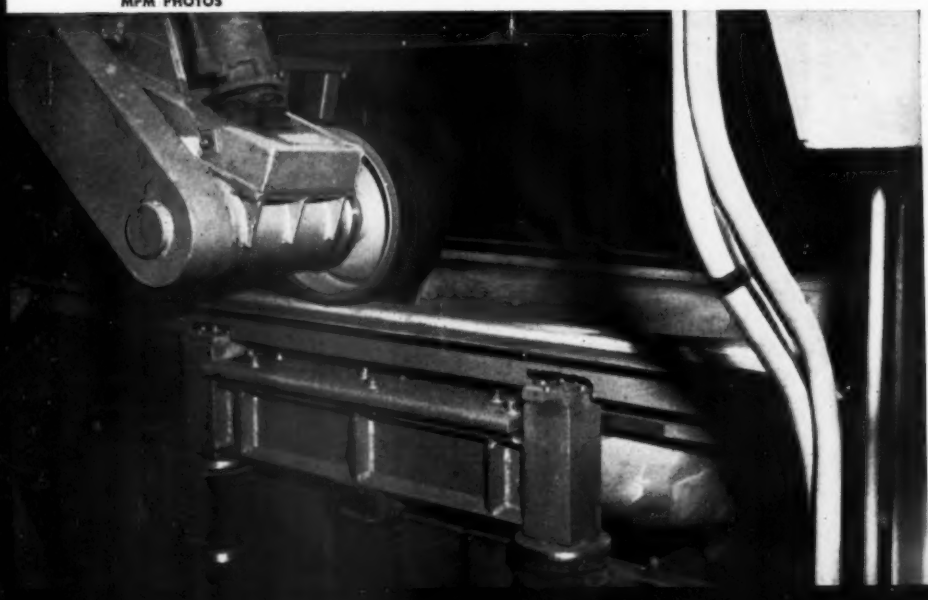
In this view are shown semi-automatic process of applying drawing compound, (left), gravity roller feed of the sheet into the press (foreground), and drawn tub. The light colored rollers apply the specially-prepared drawing compound to the sheet. This compound plus carefully designed meehanite dies permit the 14⅞-in. draw in one press operation. MPM PHOTO



This is a view of the press line from the feed end of the drawing compound applicator (left). The first press is used to make the 14⅞-in. draw in one pass. The next press is used to draw the ⅛-in. safety bead, the third press punches the drain hole, and the fourth press is used to trim.

Spot welding a hanger bracket to the end of one of the steel bathtubs. (above). A closeup of the automatic belt sanding operation (below). Lifting device in foreground holds tub in position for the belt sander to make a back and forth pass on the tub "seat." Sixty-grit belts are used to get the proper "finish."

MPM PHOTOS



When the metal is drawn down the flat sides of the tub and into the bottom, 7 in. deep "scallops" are left on the long edges of the formed blank. Provision for the elimination of strains around the drain holes, which could possibly cause failure at this point, is made by drawing extra metal into a "sump" for subsequent forming and piercing.

Proof of the success achieved in the draw operation is that no annealing is necessary. Six presses perform these operations.

Final draw depth 15 inches

A safety bead is pressed into the bottom of the tub in the second step along the press line. This wavy bead is one of the positive identification marks of a Briggs pressed steel tub. This is done on a similar press to the first one and extends the final depth of draw to 15 in.

Mechanical arms remove the formed blank from the first deep draw and place the tub on a slat conveyor that runs along the entire press line. The entire operation from the time the steel sheet is fed into the roller applicator for the drawing compound to the automatic ejection of the formed blank is controlled by a drum roller contactor incorporated into the controls of the first press. This drum roller contactor automatically controls movement of the sheet into the press, the action of the press and ejection. Each time a sheet is receiving an application of drawing compound another is being drawn and yet another is awaiting entrance into the die.

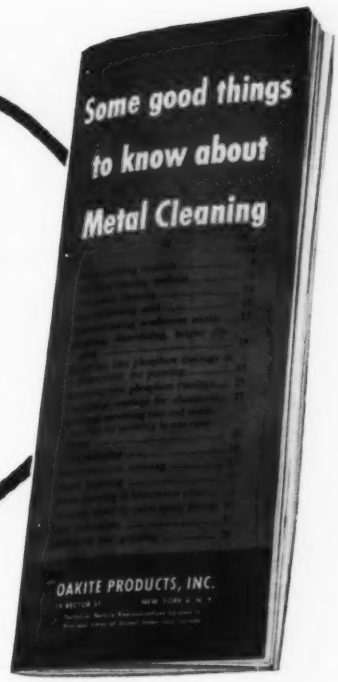
The formed blank is then trimmed and then it moves to a 1600 ton press for the "draw-flange" operation which consists of forming the front flange (on the long exposed side of the tub). A second flanging operation, by means of cams, produces a "return" or welding flange to which the front apron is attached in assembly. Then the blank moves to a horn type press for piercing of the overflow drain hole. This step includes embossing around the edge of the hole so that the overflow drain and the bottom drain are in alignment with each other to insure proper installation of the brass waste and drain.

Following this step the front flange is struck in a restrike operation to provide a 90° surface for subsequent welding of the apron to the tub.

Scrap from the trim operation on the tubs is used to form the hanger brackets which are welded on to the tubs for conveying through the firing cycle.

to Page 49 →

WHICH METAL-CLEANING JOBS WOULD YOU LIKE TO IMPROVE?



¶ Are you cleaning metal in the most economical way? *See page 9 of Oakite's FREE booklet on Metal Cleaning.*

¶ Are you cleaning metal the fastest way? *See page 12.*

¶ Do you need room-temperature cleaning combined in one operation with temporary rustproofing? *See pages 12 and 14.*

¶ Do you know the advantages of *alkaline* pickling? *See page 21.*

¶ Have you compared the values of iron phosphate coating and zinc phosphate coating in preparation for painting? *See pages 22 and 25.*

¶ Can you use a cleaner that removes rust and oil at the same time; often eliminating all need for pickling? *See page 30.*

¶ Do you have trouble stripping epoxy resins, pigment residues, phosphate coatings and under-paint rust? *See page 31.*

¶ How do you clean parts that are too large to be soaked in tanks or sprayed in machines? *See page 31.*

¶ Are you getting full profit out of your finishing barrels? *See page 32.*

¶ What do you do when oversprayed paint neither floats nor sinks in your paint spray booth wash water? *See page 35.*

¶ Do you need better protection against rusting in process or in storage? *See page 37.*

Here is the full table of contents of Oakite's 44-page illustrated booklet called "*Some good things to know about Metal Cleaning*".

Tank cleaning methods
Machine cleaning methods
Ultrasonic cleaning
Electrocleaning steel
Electrocleaning nonferrous metals
Pickling, deoxidizing, bright dipping
Applying iron phosphate coatings in preparation for painting
Applying zinc phosphate coatings
Conversion coatings for aluminum and zinc
Cleaning, removing rust and conditioning for painting in one operation
Paint stripping
Steam-detergent cleaning
Barrel finishing
Better cleaning in hard-water areas
Treating water in paint spray booths
Rust prevention
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Better Porcelain Enameling Starts HERE!

Original model for production of **BRIGGS** SANITARYWARE

Another *model plant* designed and built by Ferro is the new sanitaryware facility for Briggs Manufacturing Company at Warren, Michigan. From the portable scale-model shown above Briggs and Ferro engineers were able to check every major detail of production, make changes where needed, then save time and money in construction. (In this case, a third furnace was added and the floor plan changed accordingly.)

Better porcelain enameling starts in the planning stage . . . and Ferro brings you a world of "know-how" in getting the *best*, and the *most* for your money.

FERRO

FERRO CORPORATION

Engineering Division – Designers and builders of complete plants for the porcelain enameling and chemical industries

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Porcelain enameling steel plumbing ware at Briggs

Up-to-date in every respect, the porcelain enameling facilities put the 'beauty' in Briggs Beautyware. The complete line of steel plumbing ware is produced in six sparkling colors plus white, in a three-furnace operation.

by John Sincere • TECHNICAL EDITOR • IN COLLABORATION WITH *Arnold Kohler,* SENIOR VICE PRESIDENT, AND *John Thompson,* CERAMIC ENGINEER.

EXCLUSIVE MPM PHOTO

Cover coat spray booth showing hooks used to support tubs, allowing them to be turned in any position desired.

MPM EXCLUSIVE FEATURE

Every step of the porcelain enameling operation at Briggs is integrated so that high quality ware can be turned out efficiently at all times and yet still allow enough flexibility for rapid change-over in colors. As in fabrication, in-process conveyors at the start and end of metal preparation and enameling allow for maximum flow through finishing or flexibility of movement during schedule changes.

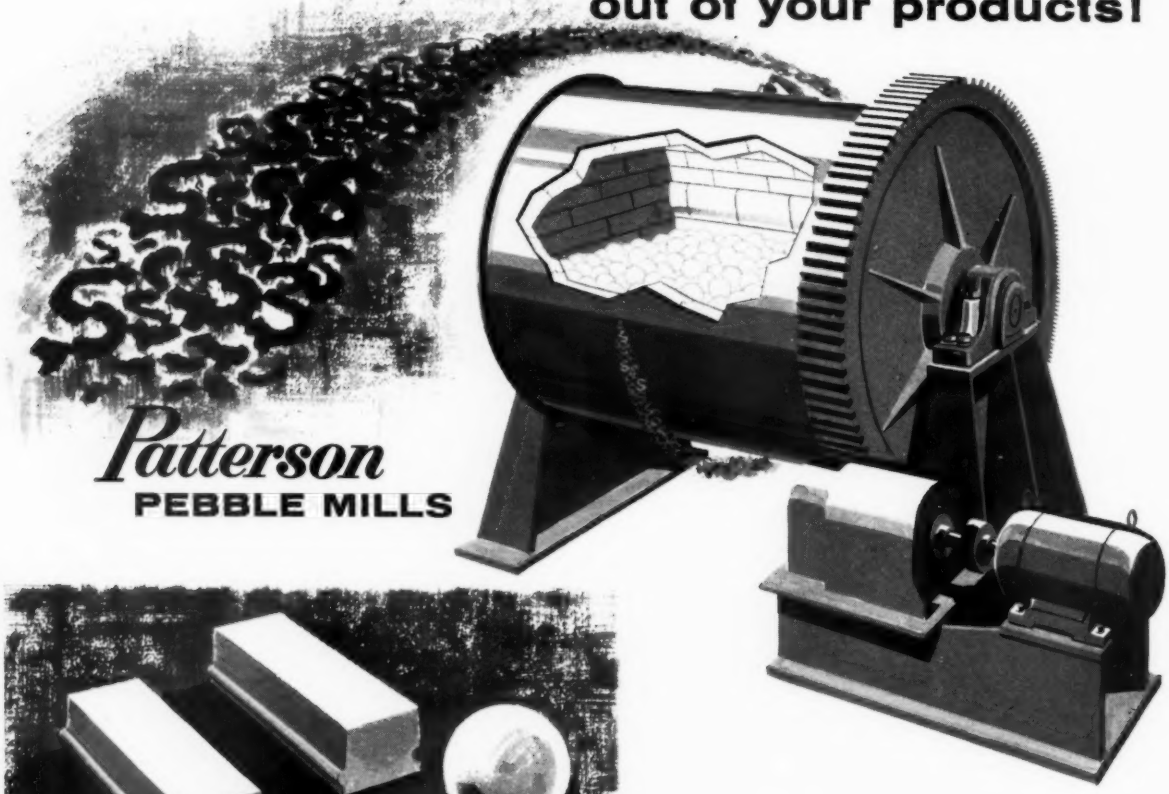
Six colors and white are produced for the complete line which includes bathtubs, lavatories and kitchen sinks. These colors are: sky blue, sandstone, autumn yellow, pearl gray, coral, and sea green. With the exception of sky blue, which is an antimony base frit, all of the colors and the white are titania based frits. All porcelain enameling at Briggs is based on a three coat operation. Total fired thickness of the one ground-two cover coat process is approximately fifteen mils.

Cleaning and pickling three tubs per minute

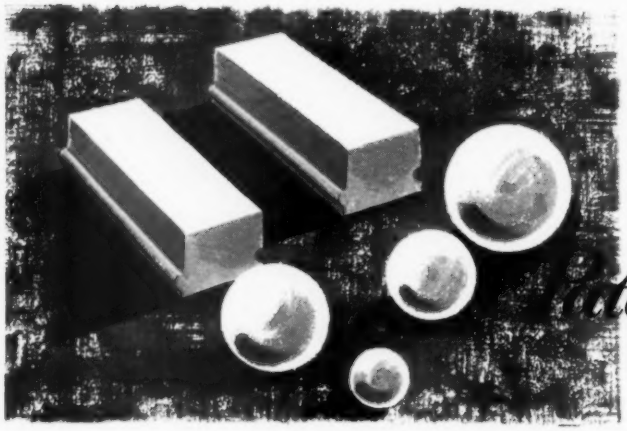
The first of the finishing operations is the metal preparation of the ware by an automatic continuous immersion pickling machine. The conveyor carrys

. . . for grinding **Profits**

out of your products!



Patterson
PEBBLE MILLS



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In frit grinding, look to Patterson for lower operating costs, with higher product quality!

Patterson experience has made available much data useful in helping you analyze the best combination of operating factors for optimum mill performance—*correct mill speed, ball charge and size, material consistency and charge.* Let a Patterson engineer work with you in studying the economics of your grinding application. *Write or call!* There's no obligation.

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PROCESS EQUIPMENT
OF ENDURING SATISFACTION

THE *Patterson* FOUNDRY AND MACHINE COMPANY
A Subsidiary of Ferro Corporation
East Liverpool, Ohio

THE *Patterson* FOUNDRY AND MACHINE COMPANY (CANADA) LIMITED
Toronto, Ontario

Tubs travel through the pickling process on arms which lower ware into various tanks. Speed along the pickle line is approximately one tub every twenty seconds.

MPM PHOTO

the tubs at a level to permit the loading crew to transfer the ware to the conveyor arms that move the ware through the pickler line.

Location of the U-type pickler is perpendicular to the spray booths, dryers and furnaces, at one end of the building that houses the porcelain enameling operation. The efficient ductwork over the alkaline and acid solutions removes all vapor fumes from the area.

Normal speed along the pickle line is approximately one tub every twenty seconds. The entire pickler measures 160 ft. from entrance to the "U". It has 8 ft. wide tanks for each of the solutions. Two successive tanks of alkaline cleaner, each about 41 ft. in length comprise the first treatment for the ware. Next come two rinses of hot then cold water in 7 ft. long tanks. Acid treatment follows in two consecutive tanks each approximately 23 ft. in length.

Cold water rinse comes next in the tank that forms the U-bend. A 54 ft. tank of nickel dip follows and then a brief cold water rinse in an 8 ft. long tank is followed by two successive solutions of neutralizer in tanks 23 ft. and 10 ft. in length, respectively. A trip through a 34 ft. long dryer supplied with high velocity warm air readies the ware for transferring to conveyors feeding the ground coat spray booths.

Enamel preparation

Preparation of the porcelain enamel at Briggs begins in the spacious storage and weighing room located above the mill room. After the materials are weighed out, the batch is loaded directly into the mills by means of permanently installed chutes.

Mill room facilities include the most up-to-date equipment obtainable. Two four thousand pound mills are used for preparation of the three largest volume enamels. One of these mills is used exclusively for ground coat while the other is used for white and the biggest volume color which, at the present time, is coral. The third and fourth mills, both of three thousand pound capacity, are used for the remaining colors; gray, yellow, sandstone, green and blue. The blue antimony frit is processed in one of these mills exclusively while the remaining colors, since they are all titania frits, are handled in the other three thousand pound mill.

Completing the mill facilities are two one thousand pound mills that are used for miscellaneous and experimental purposes. High density grinding media are utilized in all of the mills in accordance with latest milling practice. →

The first two mills are 4,000 lb. units used for ground coat and white, respectively. The second mill is also used for the largest volume color which, at the present time, is "sandstone."

MPM PHOTO

A view of the well-equipped millroom showing the upper storage tanks into which slip is pumped from the mills, and the agitator-equipped storage tanks (below) into which the slip is gravity fed through the centrifugal sieves at the extreme left.

A view of the transfer area from the pickling line to the application line. The tubs on the first conveyor are on their way to the ground coat spray booth. Just behind this first conveyor, the tubs are shown emerging from the dryer at the end of the pickle line. MPM PHOTO

Ground coat is fired in a 160-ft. full-muffle gas-fired furnace having a hot zone of 60 ft. Ground coat is fired at 1560° F. and the firing temperature of cover coats is 1540° F. Before the ware enters the furnace, it passes through a blow-off booth to remove any foreign material.

Slip is removed from the mills by means of rotary pumps with screw type impellers to overhead storage tanks. From these tanks the slip is fed by gravity through centrifugal filters and magnetic separators. Enamel set is checked in these tanks and then, upon demand, the slip is pumped into one of six pressure tanks that are connected to six separate stainless steel pipe lines leading into the spray booths.

Application

Each of the three coats of porcelain enamel is applied in two separate but adjacent spray booths. In other words, there are six spray booths arranged in pairs — one pair for ground coat, one for first cover coat and one for final cover coat. Separate lines convey the ware through each of the spray booths. Both lines run concurrently through the single tunnel U-type dryer from which the ware is transferred to the furnace chain. This same method is followed for the first cover coat and the final cover coat.

Ware is transferred from the pickler conveyor to the two ground coat conveyors.

The pipe lines that supply the slip to the respective booths are arranged as follows: one line to each of the ground coat booths and 5 lines to each of the cover coat booths. The 5 lines feeding slip to the cover coat booths are used for the six colors and white slip. When a switch from one color to another is necessary the fluid pressure regulator, spray guns and fluid hose are flushed out at a cold water line and connected to the appropriate manifold which is ready for immediate use. An advantage of this type of supply system is that uniform spray pressure can be maintained in each of the 5 spray lines. Both first and final cover coat spray booths are supplied with one source of slip since once a change in color is made it is made for the entire line.

Specially designed crescent shape hooks are used to convey the ware through spraying and drying operations. These large hooks permit manual revolving of the ware to enable workmen in the spray booths to reach all surfaces of the tubs. The bearing that allows the hooks to be revolved is made with cammed indexes so that the ware

to Page 49 →

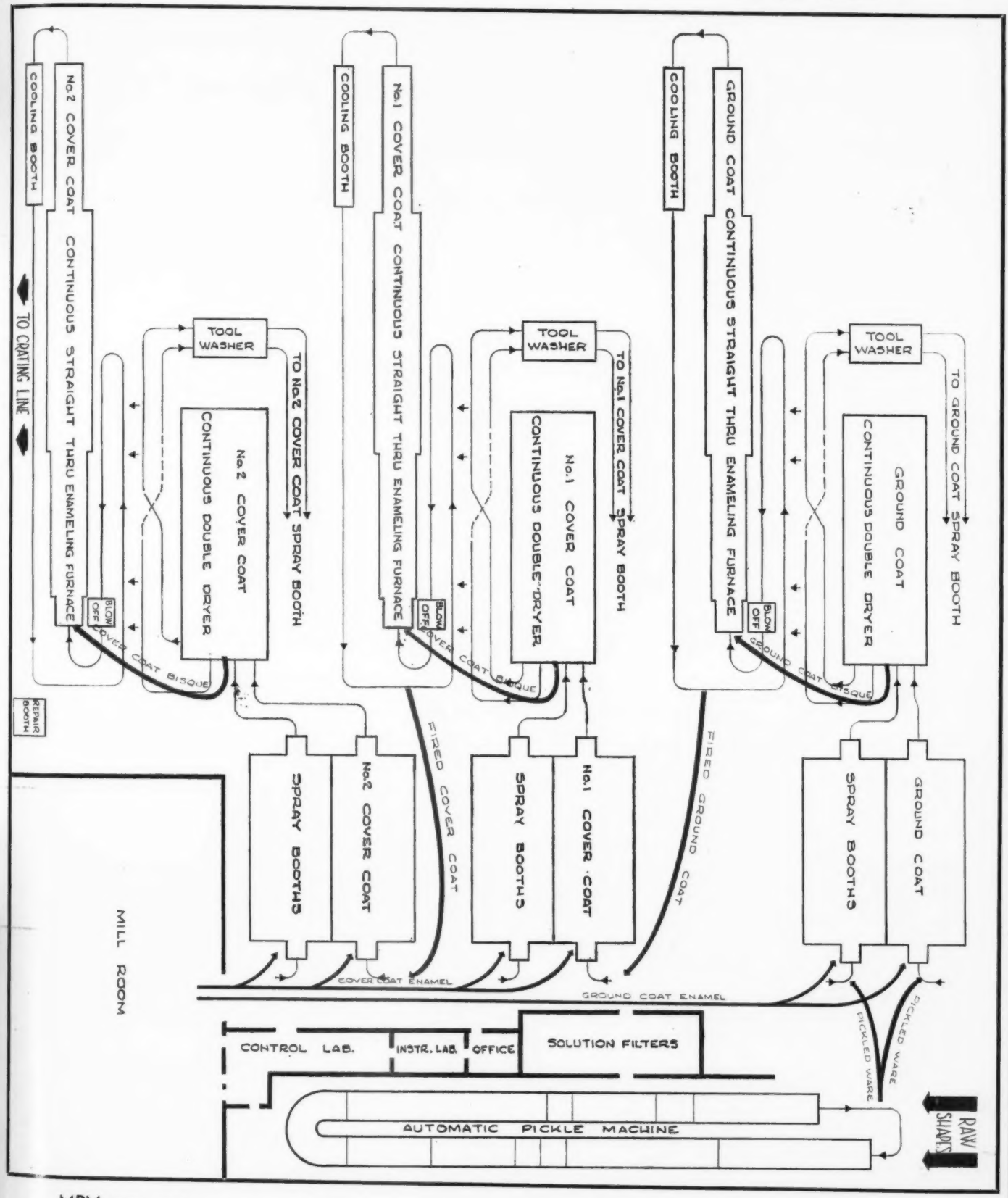
EXCLUSIVE MPM PHOTOS

Each tub is inspected very closely for defects. This is a view of the line emerging from the cooling booth after the final cover coat has been fired.

Workmen are removing the finished and inspected tub for transfer to a nearby truck for movement to the shipping and storage area of the plant.

Porcelain Enamel Process Flow Diagram at Briggs

DRAWING COURTESY FERRO CORP.



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...for years of economical rod service

Have you tried Inconel* nickel-chromium alloy for hanger rods?

For long run economy in this service, you can depend upon Inconel.

Within standard enameling temperature ranges (1475 to 1550°F.) and on up to the range where high temperature ceramic coatings are applied (1850°F. approximately), Inconel nickel-chromium alloy delivers excellent heat and corrosion resistance. It resists oxidizing and other corrosive conditions common in enameling operations.

At those temperature levels, this nickel-chromium alloy retains high creep strength. Even after years of continuous operation, Inconel rods of proper design show no stretch.

A change to wrought, light-weight Inconel rods can mean lower fuel costs, too. For, with less dead weight in the furnace, it takes less fuel to get to heat and stay there.

What's true of this alloy for drop rods, is equally true for burning tools and furnace parts.

So, if heat and corrosion are creating problems with items of this type, see what Inconel nickel-chromium alloy can do. You can get more information by writing for "Keep Operating Costs Down ... When Temperatures Go Up." It's free and a useful booklet to have. For detailed technical assistance, call on Inco's Technical Service Section.

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*Registered Trademark

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Inconel... *for long life at high temperatures*

Design for the York home comfort center

AN MPM ENGINEERING FEATURE

compact unit heats, cools and electronically cleans air—in short, a system for year-round air conditioning built into a practical space saving unit

The cooling coil casing is designed so that it can be installed with the furnace for later addition of the cooling system. The "A" design coil has aluminum fins properly spaced on copper tubes to provide maximum air contact to dehumidify and cool. Coils slide into the casing from the access panel side, making installation relatively easy. Note humidifier position below cooling coils.

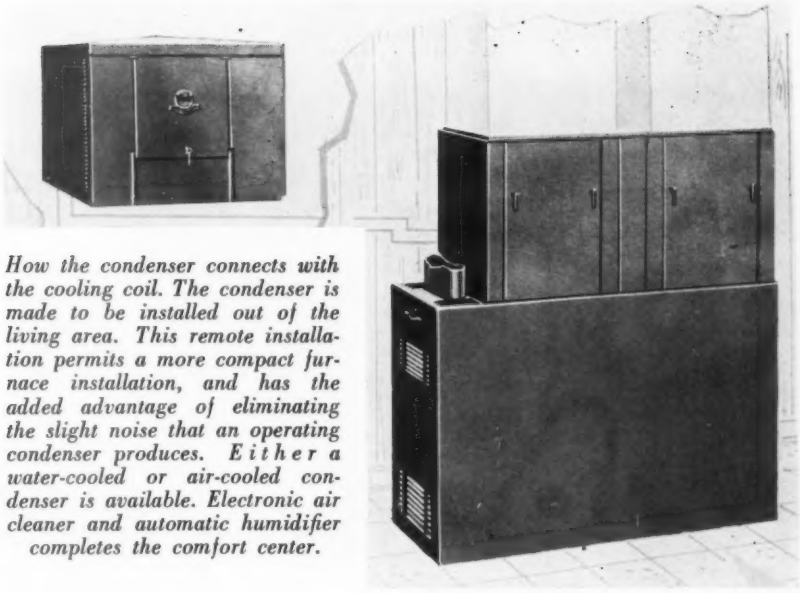
Complete year-round humidity control. Built to mount on the cooling coil casing, the automatic humidifier supplies properly balanced humidification during the winter heating operation. A built-in thermostat regulates the water feed as the furnace temperature varies. The room thermostat (not shown) has switch positions for the fan including: "auto-on" and "heat-off-cool."

Electronic air cleaner, developed in the Borg-Warner research laboratories, consists of three basic parts, the power pack, the charging section and the collecting section. Air borne particles passing through the charging section receive a positive electric charge, then enter the collecting section where the positively-charged particles are attracted to the negatively-charged collector plates. Particles as small as 1 25,-000 of an inch accumulate on the collector plates.

Dynamically balanced blower wheel circulates both warm and cool air. Blower speed is adjustable to specific need. Rubber cushion mountings absorb vibration. Blower bearings are permanently sealed and should never require lubrication. Motor is 115 volt, inherently protected, operating at 1750 rpm.— sized to handle summer-winter operation.

AGA approved controls include a 24-volt gas valve, safety control, limit switch and fan control. A pressure regulator also helps to insure proper furnace operation. Non-clogging cast iron burners are of milled, slotted construction.

The entire furnace and components are fabricated of a heavy gauge sheet steel, zinc coated, phosphatized and finished in a baked blue organic enamel. The final coat is a rich hammertone finish that is relatively hard and scratch resistant.



How the condenser connects with the cooling coil. The condenser is made to be installed out of the living area. This remote installation permits a more compact furnace installation, and has the added advantage of eliminating the slight noise that an operating condenser produces. Either a water-cooled or air-cooled condenser is available. Electronic air cleaner and automatic humidifier completes the comfort center.

MPM EXCLUSIVE FEATURE

YEAR-ROUND air conditioning for the home is rapidly becoming more and more popular. Probably one of the best reasons for this is the availability of equipment that can do the job efficiently without taking up a great deal of space in the home. Another factor is that people are coming to the realization that an air-conditioned home is not only more comfortable, but healthier. An air-conditioned home is also proportionately more valuable.

One company that has done a complete job in marketing a compact unit for heating and cooling with such built-in plusses as electronic air cleaning and automatic humidity control is the York Corp., a subsidiary of the Borg-Warner Corp., York, Pa. Called the York home comfort center, the unit combines heating and humidification with electronic air cleaning to provide warm air conditioning —plus— balanced summer air conditioning, dehumidification, and electronic air cleaning for summer comfort.

The basic component of the system is a gas-fired warm air furnace that is designed to be operated either with or without the electrostatic air cleaner or the air conditioner cooling coils. The latter two units are designed to fit on the top of the furnace to replace part of the incoming and outgoing air ducts. The electronic air cleaner is positioned over the incoming air opening to clean the air prior to entering the blower and heating chamber. The air conditioner cooling coils are located over the exit opening of the furnace.

Electronic air cleaner

The electronic air cleaner, developed in the Borg-Warner research laboratories, consists of three basic parts, the power pack, the charging section, and the collecting section. Air-borne particles passing through the charging section receive a positive electric charge, then enter the collecting section where the positively-charged particles are attracted to the negatively-charged collector plates. These minute dust and pollen particles as small as 1/25,000 of an inch accumulate on the collector plates. The unit operates with the furnace blower during both winter heating and summer air conditioning. It shuts off automatically when the blower stops. To make servicing simple and hazard free, a safety interlock is incorporated into the unit that shuts off the current automatically when the panels are opened. The unit is cleaned simply by turning off the current, sliding out the collector assembly, and rinsing it in luke warm water.

Cooling coil

The cooling coil is housed in a casing designed to fit on the top of the furnaces that make up the home comfort center series. Aluminum fins properly spaced on copper tubes provide maximum air contact to dehumidify and cool all the air circulating through the heating-cooling center. "A" type coils are used to furnish heat transfer for efficient cooling.

The coil casing is designed so that it may be installed with the furnace for later addition of the cooling system to make a packaged year-round installation. Coils slide into the casing from the access-panel side, making installation relatively easy.

Condensing section

Either air-cooled or water-cooled condensers are available with the comfort center. The air-cooled model consists of condenser coil, condenser fan, receiver, hermetically-sealed compressor, and electrical controls. The unit is designed to be installed outside the living area. The casing finish is weather resistant to permit installation in the yard, breezeway, or carport. The water-cooled condenser can be installed in or out of doors. It includes a tubular counterflow condenser, receiver, rubber-mounted hermetically-sealed compressor, and electrical controls grouped on a rigid metal base.

The condenser casing is fabricated of a heavy gauge sheet steel with a "pyramid top" pitched to drain rain water. The entire casing is zinc coated, phosphatized, and is finished in a blue baked enamel. The condenser coil has staggered tubes and corrugated fins for more efficient cooling. Aluminum fins spaced 12 per inch hold the expanded ½ in. diameter copper tubes. The coil contains a liquid subcooling circuit for effective cooling.

Humidifier

Built to mount on the cooling coil casing, the automatic humidifier supplies properly-balanced humidification during the winter heating operation. A built-in thermostat regulates the water feed as the furnace temperature varies.

Thermostat

An attractive low voltage thermostat automatically controls heating and cooling. Switch positions for the fan include: "auto-on" and "heat-off-cool" to allow the user to select the operation desired. The heating operation includes a heat anticipator for even temperature control.

Metal curtain wall construction increasing

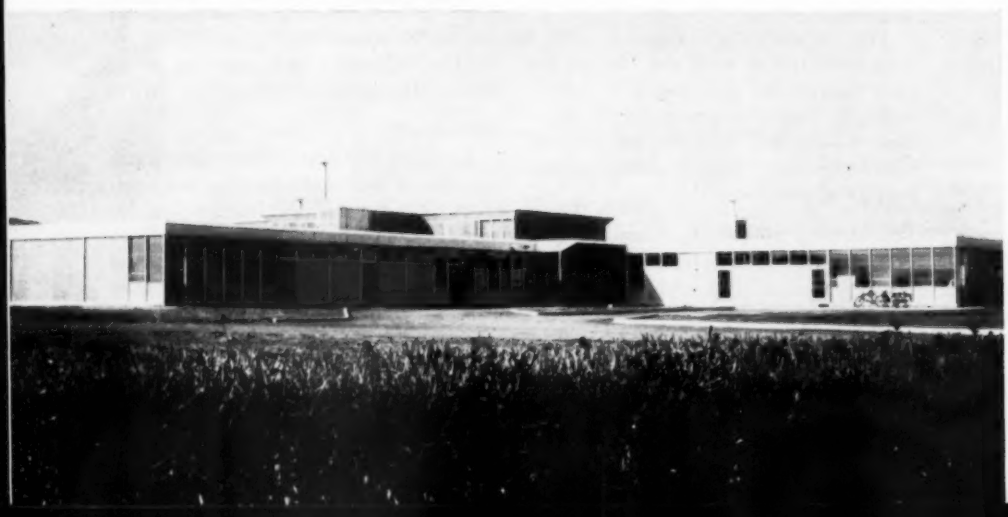
The Edificio Banco Popular, Mexico

This $2,000,000 20-story office building now being erected in Monterey, Mexico, will become one of Mexico's largest air-conditioned structures, and is to be sheathed with curtain wall panels. Republic Steel's Truscon Div. supplied the porcelain enameled steel panels. The building will be of bright red porcelain enamel and stainless steel on three sides and masonry on the fourth side.

World's Largest Curtain Wall Installation

Architect's rendering of the new 30-story air-conditioned office building to be erected at 2 Broadway, New York City, by 1959. 350,000 square feet of curtain wall will cover the building. Steelwork is now progressing on the building and will contain 1,300,000 sq. ft. of rentable space.

Structo School in Emmitsburg, Md.



The beautiful school shown here utilizes porcelain enamel panels in a variety of colors that were produced by Ingersoll Products Div., Borg-Warner Corp. for U. S. Steel Homes Div. of U. S. Steel Corp. The design of the panels is such that each can be interchanged thereby resulting in a module panel that can be used in any combination or size school a designer requires.

photos here show some of the most notable buildings recently completed and others that are still in the planning stages

John J. Kane Hospital Near Pittsburgh

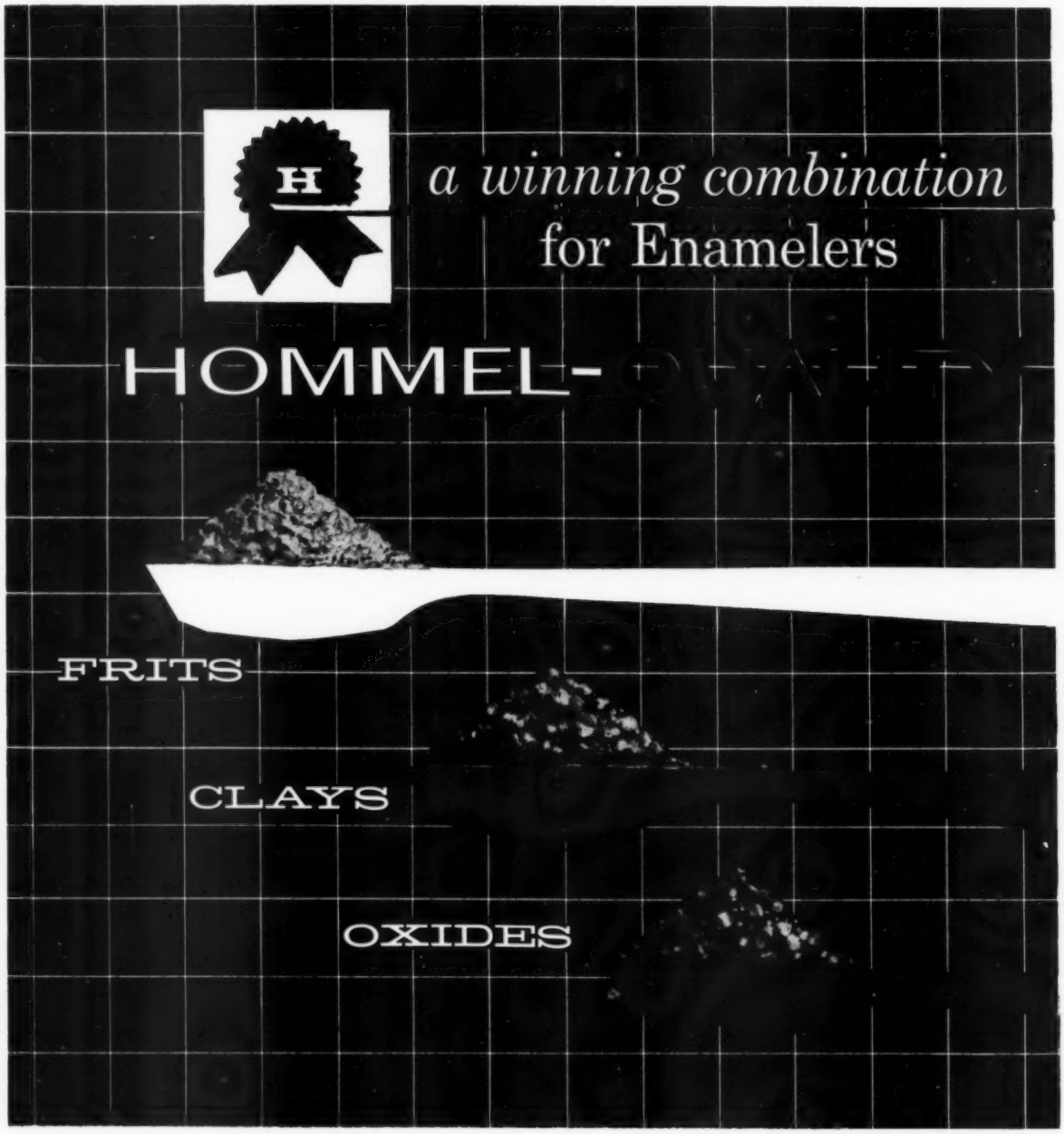
The aluminum clad John J. Kane Hospital, one of the most modern hospitals in the country, is located on a hilltop near Pittsburgh, Pa. The 2,100 bed plant utilized more than 1,750,000 pounds of aluminum throughout the structure. All aluminum on the project was furnished by Aluminum Company of America.

666 Fifth Avenue, New York City

This 38-story office building at 666 Fifth Avenue, in New York City utilizes porcelain enamel on aluminum in white to highlight the design of the structure. 20 inch wide strips of the material separate Aluminum curtain wall panels.

Miami Beach Federal Building

Completed 15-story Miami Beach Federal Building. Structure uses curtain wall from immediately above the first floor level up to the head of the 13th floor. Black granite and glass mosaic complement the porcelain enamel panels.



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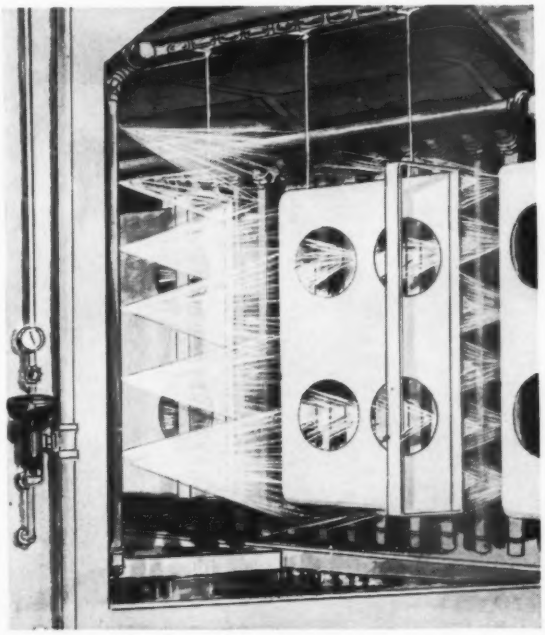
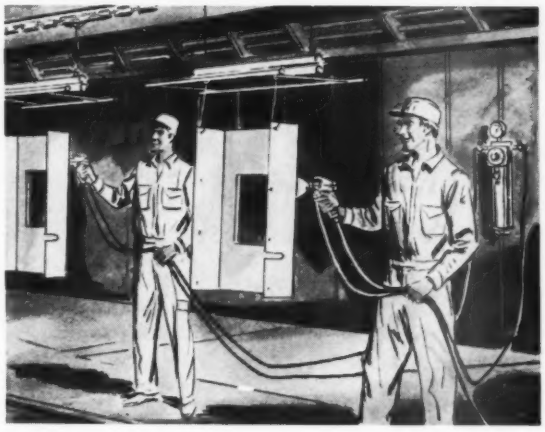


In your vitreous-enameling department:

Insure efficiency with Expray 541. Heavy-duty spray cleaner for all drawing compounds. Nonfoaming, long life, stands up under heavy soil loads.

Lower your costs with W.L.G.®. The industry leader for heavy-duty vat cleaning. It will remove even the toughest soil deposits in less time than ordinary cleaners. And W.L.G. will lower your costs, since there is less frequent dumping. Its effectiveness has been proven again and again in hundreds of plants. W.L.G. has established itself as a favorite everywhere.

Get tightly bonded with vitreous enamel with INDUSTRIAL NO. 6 NEUTRALIZER. Eliminates neutralizer salt deposits and streaks in vitreous-enamel ground coats. Minimizes rust after pickling. It lasts 2½ to 5 times longer than soda ash-borax or cyanide-type neutralizers.



In your painting department:

Simplify your processing with PRE-FOS®. Used on steel, zinc, or aluminum, PRE-FOS provides a superior base for paint, and greatly increases corrosion resistance. It simplifies your processing by cleaning and phosphating in a single operation. Its deposit of a fine grained, corrosion-resistant iron-phosphate coating saves paint and provides superior impact resistance. PRE-FOS may be adapted for spray or immersion use.

Want further information on trouble-free metal-finishing operations? Contact your Wyandotte representative; or send coupon below. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

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Kitchen cabinets | Home freezers | Commercial refrigerators | Air conditioners | Business machines

Boca Raton Hotel and Club, Boca Raton, Florida, site of the 42nd Annual Meeting of the American Home Laundry Manufacturers' Association.

Five questions for the home laundry industry

by Guenther Baumgart • AHLMA PRESIDENT

THERE HAVE BEEN many reviews of the national business trend, and additional specific reports on the past and projected trends in home appliance production and sales.

I suggest that our own home laundry appliance industry consider a few pertinent questions as we near the time for our annual meeting.

It would be in order to consider any factors which we can recognize as portending a turn from the down trend — and consider the things which sound management can do to encourage them.

What do you think?

Examine this list of five questions — then add a few of your own:

1. *Is the burst of "automatic" wash-and-wear garments a recession-born Godsend on which to base a turn upward?* Can we through publicity and advertising foster the consumer's constant striving for labor saving devices and overcome his reluctance to buy, and effectively compete for the dollars he does spend? I think so. I think, too that fiber makers, as well as our own industry, are working in this same direction. Educators and writers are also adding impetus to the popularity of wash-and-wear because it is a sound, scientific, excitingly-new development.

2. *Is prompt, efficient appliance servicing a golden opportunity which we may be overlooking?* Are we missing an opportunity to encourage new sales? Is there an opportunity on the part of the serviceman to develop brand loyalty and encourage trading up or replacement by consumers most able to afford it? Are there opportunities to encourage homemakers to make more efficient, full use of home laundry appliances, to want a complete laundry: washer, dryer, and ironer? I think so. I think the service entree to homes can inspire confidence, create demand, and establish an opportunity through which management can certainly do something to brake the recession to encourage the recovery.

3. *Is the replacement market, itself, something to develop to a greater extent today?* Note that the 6-9 year replacement age is the most important:

9 years ago	2,978,445	Washers were sold
8 years ago	4,311,018	Washers were sold
7 years ago	3,174,588	Washers were sold
6 years ago	3,460,396	Washers were sold
THE TOTAL	13,900,000	Washers were sold

Fourteen million washers ready to be replaced with automatic wash-and-wear appliances! Management can certainly do something about that!

4. *Is our marketing management keeping up with the efficiency of the machines we develop?* Are we developing new areas, or concentrating only where the rest of the industry is selling? Is "share of the market" more important than absolute gains? Are we competing with each other in a closed system, or with the whole world for consumer's favor and investment? Shouldn't our grand overall objective be high saturation? Are we really helping raise the whole world's standard of living? Can we maximize the efficiency in the production — inventory — market levels — equation? To the extent that each company does, the consumer will benefit, and that company will, too, through profits. Profitable companies will, indeed, contribute greatly to the rise of the national economy.

5. *Can we use our Association even more efficiently?* (I couldn't end without this.) We do have a very efficient market measurement system which is invaluable to members in their analysis of performances. We have engineering and industrial relations and home economics activities — and 16 other committees working in technical management fields in the interest of the whole industry. We have a program this year of important public relations and publicity activity which should capitalize on "automatic" wash-and-wear and, through the use of the Association's acceptance, open more opportunities for individual company publicity than has ever been developed before. This is our goal. We have one of the finest public relations devices in the world, our Home Laundry Conference, through which to serve our mutual interests with educators, editors, extension workers, the laundry chemicals industry and, most importantly this year, the fiber and fabrics industry. Management is, indeed, doing something against recession through its participation in Association committee meetings, and with great efficiency.

(see AHLMA program on Page 60)

MPM announces

Mrs. Home Laundry Queen for 1958

DURING 1957 MPM, for the second consecutive year, sponsored a contest for the selection of Mrs. Home Laundry Queen. The contest was open to all home laundry appliance manufacturers, and was based on the selection by MPM editors of a suitable queen from photographs entered by individual manufacturers.

Home Laundry Queen for 1957, based on the 1956 contest, was 22-year old Patricia Hughes of Buffalo, N. Y.— housewife and mother of two children. (Entry of Easy Washing Machine)

The 1958 Queen shown on these pages is 21-year-old Kathleen Marie Boyle of Arlington Heights, Illinois, Norge entry and former secretary in the Norge Chicago offices. Unlike the previous winner, Mrs. Boyle is not a professional model. She has now retired from her

Left — Here is a reproduction of the photo which won MPM's *home laundry queen contest for the Norge entrant. The photo appeared originally in the 11th annual special home laundry section of* MPM.

Center — Mrs. Home Laundry Queen for 1958 is shown receiving a bouqet of garnet roses, and announcement that she is the contest winner, from Dana Chase, Jr. for MPM.

Right — The new queen, Kathleen Marie Boyle, with husband, Thomas Boyle, and ten day old Kevin Regis Boyle.

position to spend full time as a housewife and mother.

Mr. Boyle is District Sales Representative for American District Telegraph Company.

The first son, Kevin Regis Boyle, was most considerate in timing his arrival early enough to permit the MPM photographer to register the new son's approval of the new Queen.

With this fine start of a new family, it seemed to our editors that a new automatic washing machine would make a most appropriate gift from MPM to the Queen. Norge officials were most cooperative in arranging for our order to be filled with the first of the 1959 models to come from the production line. Inasmuch as the '59 line will not be shown to distributors until mid-April, the washer was photographed "under wraps." Delivery will follow the official introduction.

Plans for a continuation of the contest to select a Queen for 1959 have not been finalized, but if interest among the manufacturers continues at a high pitch, it is expected that the idea may be continued as an annual feature of METAL PRODUCTS MANUFACTURING.

Prize for a Queen. L. R. Ardis, vice president in charge of the Washer Plant of Norge Division, Borg-Warner Corp. at Herrin, Illinois, is shown with the first 1959 automatic washer to come from the production line. This machine will be delivered to Mrs. Kathleen Boyle as MPM*'s prize to the contest winner.*

MPM EXCLUSIVE FEATURE

The bathroom has sure come a long way

since the days of our ancestors

Old-time pedal-power shower bath was a great conserver of water.

Coal miner's wife does the daily scrubbing of her dirty husband.

TAKING A BATH in the days of our forebears was really a chore. Those poor folks just didn't have the facilities for frequent bathing.

What a difference—then and now! Our modern bathroom is really a citadel of sanitation—equipped with a gleaming surface that is endlessly durable and so easy to keep clean it almost does that job itself. What a boon to luxurious living are modern porcelain enameled products made with Chicago Vitreous frits. They assure the enamel plant superintendent of easy workability . . . uniformity . . . less rejects . . . steady production. Their sales-making eye appeal is the clincher for sales managers, and the gleaming beauty of the finished product sells the customer on sight.

Your Chicago Vit representative will show you how easily you can put more sales appeal into your sanitary ware.

FOR FINEST FRIT—CHICAGO VIT

A DIVISION OF THE EAGLE-PICHER COMPANY

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1425 SOUTH 55TH COURT, CICERO 50, ILLINOIS

1918-1958 • 40 YEARS OF SERVICE TO THE PORCELAIN ENAMEL INDUSTRY

Fabricating 100 bathtubs an hour at Briggs

(Continued from Page 28)

Scrap is also used for making parts for the lower frame assembly which when spot welded to the bottom of the tubs provides the self leveling or "free standing" feature of Briggs bathtubs.

At the end of the slat conveyor line the tubs are placed overhead on conveyors that carry them to welding and grinding prior to finishing.

Washing precedes welding

Before any welding is done large pieces such as the tubs and sinks are washed in a five stage alternate rinse-alkali-rinse machine. Small parts are likewise washed in a smaller three stage machine with alternate rinse-alkali-rinse cycles. Washing is necessary here to remove all drawing compounds that would hamper welding.

Hangers are spot welded to the sides of the tubs in the first operation in the welding line just before the belt sanding step. A unique machine, the automatic belt sander smooths the wide flange or "seat" on the top side. The curved vertical front face just below the top, is also sanded. The entire line from the automatic belt sander to the seam welder for joining the apron to the tub is indexed by air cylinders that are controlled by limit switches. The tubs are moved along the sanding and welding line by means of a "feed" conveyor made up of rollers, every fourth one of which is a tapered rubber covered motor driven roller. The "drive roller" is tapered toward the center to keep the tubs in line while moving along.

The belt sander consists of two stations — one for the "polish-grinding" of the top or the "seat" of the tub and one for the curved front. As a tub moves into the first sanding step the limit switches move the second, third and fourth tubs to their next station on the line.

The limit switches are controlled by the action of the special device used for turning the tubs upside down for the seam or gun welding operations. As a tub is turned over in this device and is fed into the seam welder or into the gun welding line (for straight sided tubs) the limit switches open the stops that hold each of the four tubs in position. The first and second tubs are in the sanding booth and the third and fourth tubs are in position awaiting the turn-over device. These stations allow time for any miscellaneous welding that may be necessary on special tubs.

Automatic belt sanding

In the glass walled sanding booth the first tub and the second are lifted simultaneously about a foot in height to allow the 60-grit belt sander powered by a 5-hp motor to make a back and forth pass along the top of the first tub and the side of the second. A five foot long hydraulic cylinder moves each of these belt sanders back and forth in a five foot long pass. As the return stroke of the sanders is completed the lifting carriage automatically lowers the tubs for moving to the next station.

After a tub is turned over it is fed into the seam welder where the apron is placed by hand into a jig to hold it in proper position in relation to the flange. As soon as this is done the seam welding machine is turned on by its operator. At an automatically controlled rate a fillet weld is deposited in the crevice between the apron and the flange by four guns. It is this operation that makes Briggs pressed steel tubs one of the finest in the plumbing fixture field. The weld that is applied here results in a tub that has the appearance of being completely integral. After the weld is ground to an absolutely smooth surface it is impossible to detect its location after porcelain enamel is applied.

Straight sided tubs are gun welded on a line that is parallel to the seam welder. The frames that perform the dual task of supporting the tub when it is installed and provide the free standing feature are spot welded in a semi automatic welding press. When this is completed the tubs are placed on a conveyor that feeds the finishing area.

Porcelain enameling steel plumbing ware at Briggs

(Continued from Page 34)

can be turned 90° at a time and yet prevent continual revolving.

The spray booths measure approximately 50 ft. in length by 21 ft. in width for each one of the pair. Three men in each booth can handle all application requirements up to maximum production rates. Forced air ventilates the spray booths forcing oversprayed enamel onto perforated stainless steel baffle plates which collect 80 per cent of the over spray; the remainder is collected in the water wash chambers running the length of each booth. Each of the workmen in the booths wears a hood that is connected to a supply of air conditioned air.

Single tunnel U-type convection dryer

Both lines of newly sprayed ware move concurrently through a U-type convection dryer that measures approximately 68 ft. in length by 24 ft. in width. In other words, the double line of ware travels through a 12 ft. wide tunnel. As the ware emerges from the dryer it is transferred to the furnace chain that runs parallel to the dryer. The conveyors are unloaded and ware transferred to the furnace chain. The emptied conveyors rise on their way to the hanger wash booth, and around to the pickling conveyor for another cycle through the line.

Firing in three U-type gas fired muffle furnaces

All of the ware is passed through a blow-off booth just before it enters the furnace to remove any foreign material that may be on the tubs as a result of handling. High velocity air is directed at the tubs in every direction to remove foreign particles. A battery of air nozzles is mounted in the "blow-off" booth.

Ground coat is fired in a full muffle gas fired furnace that is approximately 160 ft. long and has a 60 ft. hot zone. Except for the firing temperature of 1560°F. this furnace is identical to both of the cover coat furnaces. The firing temperature of the cover coat furnaces is 1540°F.

Upon emerging from the ground coat furnace the ware is sent through a 46 ft. long cooling booth before it is transferred from the furnace chain to the first cover coat application conveyors.

Every step of the operation from this point is identical to the ground coat operation except for the firing temperature of the cover coats.

Each piece of ware is thoroughly inspected for even the slightest defects as it emerges from the cooling booth. If a tub is found defective, depending on its severity, it is returned to the final spray operation or to the sand blast machine to be completely de-enameled.

Each tub bottom is coated with an asphalt based sound deadener and is now ready for crating and shipping The area of the plant near the end of the finishing line is large enough to allow for several weeks storage to enable the sales staff to meet any reasonable delivery date specified by the customer. All models and colors are available for immediate shipment.

Shown in this view at the PMI *meeting are James Danly, Danly Machine Specialties, Inc., Chicago; Paul Kjelstrom, Verson Allsteel Press Co., Chicago; Gordon Sommer, Clearing Machine Div., Chicago; T. Robert Vaucher, Niagara Machine and Tool Works, Buffalo, N. Y.; Erwin Ruff, U. S. Tool Co., Ampere, N. J.; Clint Stryker, Pres. of* PMI *and Maysteel Prod. Inc., Milwaukee; Harold Daschner, Managing Director of* PMI*; Merrill Ridgway, Minster (Ohio), Machine Co.; Wm. Staecker, E. W. Bliss Co., Canton, Ohio; Russell Hallman, Ferracute Machine Co., Bridgeton, N. J.*

New attendance record at PMI spring technical meeting

excellent program featured modern press design, cost reduction in die handling, proper die and press maintenance, safety, two plant visits and a problem solving clinic

ALL attendance records were broken at the annual spring technical meeting of the Pressed Metal Institute. Held at the Sheraton-Cadillac hotel in Detroit, March 12-14, the meeting was considered by those in attendance to be an outstanding success. Total attendance figures were approximately 360 in comparison with last year's 257.

The first day's morning session centered on the subject, "Make Better Stampings with Modernized and New Presses". It was conducted by a panel made up of press manufacturers.

Interesting case histories of how press users had problems solved by proper application of new or improved equipment were presented. Merrill Ridgway of Minster (Ohio) Machine Co. told of a case where excessive press maintenance and high operating costs due to inadequate equipment for heavy material blanking was solved by purchasing a new 400 ton press. According to his report, a direct saving on purchased repair parts amounted to $20,000 per year, not including down time and lost labor for presses formerly used.

Press rating

In the question and answer period that followed the first day's morning session, the query, "How do you rate a press"? was raised from the packed audience. William Staecker of E. W. Bliss Co., Canton, Ohio, answered saying that a subcommittee of the American Society of Tool Engineers was studying this very topic. Mr. Staecker admitted that many press users are confused by ratings at times because while one press manufacturer will recommend a 150 ton press for a job requiring 100 tons capacity, allowing 50 per cent overage for long wear and durability, another press manufacturer may recommend a 100 ton press which already has 50 per cent extra capacity built in. Both presses have the same capacity but different ratings. This causes confusion and, therefore, ratings, many feel, should be standardized.

Die maintenance

In the first day's afternoon session Bruce Krasberg, R. Krasberg & Sons Mfg. Co., Chicago, Ill., conducted one of four discussion sessions under the heading "Die Maintenance and Related Problems". One interesting point brought out was that the average cost of die design should be about 10 per cent of the cost of construction. Another was that there is no workable ratio between the number of press operators and die repair men in a typical contract shop.

Modernization of presses

On the subject of "Press Maintenance and Modernization" the question of when it is practical to rebuild a press was raised. Consensus of opinion was that if such cost exceeds 60 per cent of replacement cost then a new press should be purchased. Another important point raised was that, on a repair job, the cost of repair should be compared with the replacement cost of the press, not the book value of the press.

Russell Johnson of Croname, Inc., Chicago, Ill. spoke during the next session which was devoted entirely to safety. In summing up his talk Mr. Johnson said that small companies need not feel that they

to Page 77 →

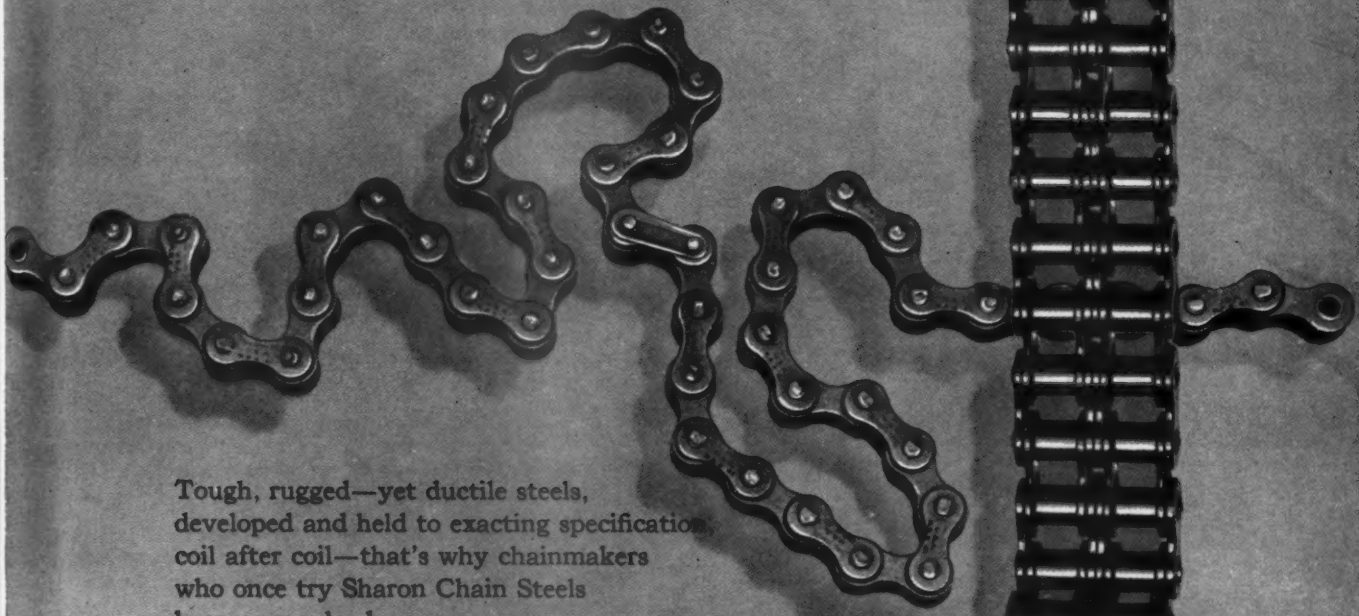
A group shown at a local PMI *meeting in Chicago recently. Highlight of the meeting was a panel discussion in cold extrusion by the Verson Allsteel Press Company. Those in this photo are members of a management productivity study group from eastern Austria. They are: W. Oburger, Deputy Director, Austrian Productivity Center, Vienna 1; W. Boeck-Greissau, Commerce Director, Schnellpressenfabrik Koenig & Bauer, Moedling, Austria; F. Dietz, Hofherr-Schrantz, Vienna 21; A. Fessl, Federal Chamber of Commerce, Vienna 1; F. Grausam, Simmering-Graz-Pauker AG, Werk Simmering, Vienna 11; F. Kraus, Sichterman Ges. mbH, Vienna; J. Neuper, OeFA-Akkumulatoren Ges. mbH, Vienna 23; W. Paik, Mineral Oil Admin., Vienna 9; W. Sommerauer, St. Egydyer Eisen-und Stahl-Industrie Ges. St. Aegyd am Neuwalde, Lower Austria; K. Widhalm, Federal Chamber of Commerce Vienna 1.*

Better Chains...

BEGIN WITH

SHARON QUALITY

CHAIN STEELS



Tough, rugged—yet ductile steels, developed and held to exacting specifications coil after coil—that's why chainmakers who once try Sharon Chain Steels become regular buyers.

If you are in the business of making chain, why not talk to Sharon metallurgists and take advantage of the first-hand knowledge of chain steels that comes from years of developing special alloys for the chain industry.

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SHARON, PENNSYLVANIA

Announcing!

a complete special section of MPM devoted to a growing industry — manufacturing AUTOMATIC MERCHANDISING MACHINES

scheduled for May • 1958

Automatic merchandising is one of the fastest growing industries in the United States. Currently an estimated 3.5 million vending machines are dispensing more than $2 billion worth of goods and services. In saluting this growth industry, this Special Section will include:

1. An industry report by NAMA executive director, C. S. Darling.
2. A look at the future by NAMA president, William S. Fishman.
3. A design engineering feature on a new industry product.
4. Photo coverage of the latest in automatic merchandising equipment.
5. New Products section for materials and components.
6. A complete manufacturing story on operations at the plant of the world's largest manufacturer of vending machines, including fabrication, finishing, assembly, etc.

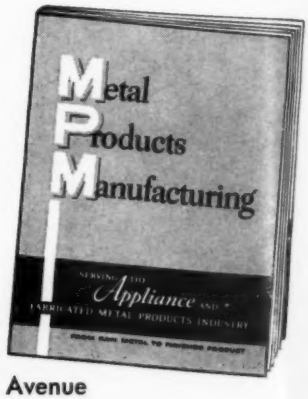
Be sure that your company is represented in the Special Section. See that editorial material and advertising reservations are handled promptly. Closing date for advertising is April 10.

Editorial contact . . . . . .
Special Projects Editor

—

Advertising contact . . . .
Manager Customer Service

ADVERTISING CLOSING DATE
APRIL 10th



Dana Chase **PUBLICATIONS**

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NEW

SUPPLIES & EQUIPMENT

Coated Abrasive Wheel Polishes Contours, Flats

For polishing and finishing contoured as well as flat metal surfaces, a versatile new flap wheel has been developed. This wearable wheel is made up of hundreds of pieces of coated abrasive cloth, with a stiffened construction which allows it to resist pressure, giving production rates and a useful life not hitherto available in wheels of this type, it is said.

In appliance and automobile manufacture, it becomes an ideal tool for smoothing out grit lines and swirl marks after discing.

The flap wheel is furnished with aluminum oxide or silicon carbide abrasive in a wide range of grit sizes, a variety of hole sizes, and in wheel sizes from 6 x 1 up to 16 x 6 in. Ten inch and smaller wheels are furnished with built-in disposable metal flanges. Reusable flanges are sold separately for use with the larger wheels. Each wheel is marked with an arrow to show direction of rotation, and stamped with the maximum permissible speed.

For further information, contact Dept. MPM, Behr-Manning Co., Div. of Norton Co., Troy, N. Y.

Color Filling and Printing Machine

An air-powered printing machine that applies color to depressed or sunken cavity letters and design, and applies color to raised panels, faces of raised letters and design, or combinations of both, has been announced.

The machine is designated as the Acroprinter Model 401-A, and it consists of a cast iron base with a platen type printing machine mounted at average operator feeding height of 32″.

A gear and rack arrangement powered by an air cylinder, which is mounted in the back, provides the operating power to apply printing pressure to any product that is properly positioned — usually on a positioning fixture. An imprint of ink or enamel in any desired color is thus applied and, by specially mounting the Acroprene die, the ink can be applied even to cavities and deep depressions. For further information, contact Dept. MPM, The Acromark Co., 524 Morrell St., Elizabeth, N. J.

Economical Clutch in Production

Electro-magnetic clutches designed for commercial applications feature small size, high performance, servo or face mounting, and zero backlash.

Known as AIM model C-125, these units have 1.25 pilot mounting diameters, clutching torque of 40 in. oz., no slip rings, and are completely self contained. When energized, the output and input shafts are coupled together; de-energized, both shafts are free running. Standard voltage is 24 to 28 dc. They are applicable to tape recording equipment, calculating machines, coin changers, and other automatic controls.

For more information, contact Autotronics Inc., Rt. 1, Box 812, Dept. #12, Florissant, Mo.

Cut-Down Saw for Metal Industry

Speed, precision, and versatility in miter and compound-angle cutting are now available to the metal working industry in a cut-down machine recently developed.

Using a 12-inch saw blade or abrasive wheel, the machine is said to have the largest capacity of any in the field, and to produce smooth cuts and perfect angles essential to the accurate joining of metal parts.

Built for 90° cut-off and miter cutting, the unit is also available with an accessory compound-angle unit that permits cutting accurate compound angles. Also available in addition is an accessory hand crank with worm-gear assembly for precise setting of the machine to accurate compound angles. An accessory for clamping the work to the fence insures precisely accurate cuts all the way through the material. It is designed for manual or foot-pedal operation. For further information, contact Dept. MPM, Irvington Machine Works, 1808 N.E. 7th Ave., Portland 12, Ore.

Fire and Shock Protected Solenoids, Transformers

A new type of solenoids and transformers, said to be fully protected against fire and shock hazards, is now available at low unit cost. They have been developed by means of a design employing a unique internal construction by which the coil becomes a self-protected apparatus. Another feature in the new solenoid and transformer is the fact that this innovation does not increase normal over-all physical size.

For further information, write Dept. MPM, Dormeyer Industries, 3418 N. Milwaukee Ave., Chicago, Ill.

PRODUCTION MORE THAN TRIPLED . . .

PAINT MILEAGE INCREASED 75% WITH

Ransburg

NO. 2 PROCESS

One Ransburg reciprocating disk uniformly coats 7 complete sets of gasoline pump housings and parts per gallon of paint. Former hand spray produced only 4 sets per gallon.

● Bowser, Inc. Fort Wayne Division is continuously on the lookout for improved manufacturing methods in the production of their quality line of gasoline pumps.

That's why they modernized their finishing department . . . installed a conveyor . . . new oven . . . and replaced hand spray with one RANSBURG No. 2 PROCESS reciprocating disk unit.

RESULTS? Paint mileage increased 75% with less labor. With hand spray, they painted enough pump housings and parts for 4 pumps per gallon of paint. Now, with *Electrostatic*, they're painting 7 complete pump sets per gallon.

Where Bowser formerly needed two shifts in finishing, one shift now handles even greater production. With hand spray and limited oven facilities, they used to turn out 15 sets per hour. Now, they can paint 55 sets an hour, either prime or finish. Color changes are made quickly and easily with Ransburg equipment, and because of its efficiency in operation, maintenance cost in the paint area is cut 50%.

NO REASON WHY YOU CAN'T DO IT, TOO!

Whatever your product, if it's painted, we'd like to tell you more about the worthwhile savings and advantages which can be yours with RANSBURG ELECTROSTATIC PAINTING PROCESSES. Write for our No. 2 Process brochure which cites numerous examples of electrostatic spray painting on a wide variety of products.

Ransburg **ELECTRO-COATING CORP.**

RANSBURG

Indianapolis 7, Indiana

Editor's Mail

→ *from Page 14*

Stainless steel article of interest

Gentlemen: We would appreciate receiving a tear sheet of the article "How to Fabricate Stainless Steel" which appeared on page 19 in the February issue of your magazine.

(Miss) Sherrill Hodgson
Technical Librarian
Micro Switch Division of
Minneapolis-Honeywell Regulator Co.
Freeport, Illinois

Finds MPM helpful

Gentlemen: In response to a letter received by us on January 24 from Mr. Ed Daleske, Director of Public Relations of the National Automatic Merchandising Association, we are attaching hereto a brief description of our venders. Also included are photographs and other pertinent data.

The writer has just returned from an extended trip through the southern states and, therefore, we have met your February 10 deadline as indicated in Mr. Deleske's letter. Since this is for May publication, it is our sincere hope that you may still be able to use the material we are sending.

It may interest you to know that several people in our organization, including myself, read your magazine regularly and I for one wish to say it is very informative, interesting, and helpful. It will indeed be a pleasure to be a part of one of the issues.

Eugene H. White
General Manager
Champion Vender Company
Niles, Mich.

Papers of interest

Gentlemen: In the March issue of METAL PRODUCTS MANUFACTURING, the report of the recent meeting of the American Institute of Electrical Engineers, held in New York City, describes papers presented which are of extreme interest to us.

Would you please advise us where we may secure a copy of the following papers:

"Heat Pump and Heating Cables Installed in the Same Residence; First Year of Comparative Operation." C. W. Jones and E. E. Linden, authors, The Narragansett Electric Company.

"Operating Cost Calculations and Experience of Air-to-Air Heat Pumps." H. N. Eanes, Alabama Power Company, author.

We are extremely interested in receipt of this information and, if freely available, would like to have two copies, one for the information of our research engineers.

V. C. Knight, President
Addison Products Company
Addison, Michigan

industrial finishing revolution!

Glidden Emulsion Paints cut costs and reduce fire hazards!

For priming, finishing metal and other materials!

You get safety by the gallon with Glidden Industrial Emulsions—water-reducible paints with qualities comparable to other protective coatings yet free of inflammable and toxic solvents.

Glidden Industrial Emulsions can be applied to any surface by dipping, flow-coating, manual, automatic or electrostatic spray. High solids plus substantial savings through the elimination of solvents generally result in lower costs.

Glidden Industrial Emulsions are now used on acoustical tile, upgraded hardboards, some automotive parts and accessories. Meanwhile, Glidden research, reinforced by 20 years experience with emulsion paints, is directed to the development of white and colored gloss emulsion enamel formulas for appliances, automobiles and hundreds of other products.

One of the Glidden Industrial Emulsions listed below may be suitable for your product. We would like to discuss your requirements with you.

White Emulsion Acoustical Tile Enamel
Grey Primer Surfacer
Black Emulsion
White Emulsion Acoustical Tile Primer
Black Dipping Primer
Black Primer
Red Oxide Primer Surfacer

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This body will remain a solid color, so it has been shunted to the conveyor which will carry it to the trim department. Automatic turntable turns body 90 degrees so that pallet will rest on twin pallet carrier chains.

Finishing automobile bodies at Ford's Rivera, Calif

Ford's M-E-L division combines modern finishing equipment with tele-autograph production control for selective finishing. Electrostatic, automatic and hand spraying are used on the line.

MPM EXCLUSIVE FEATURE

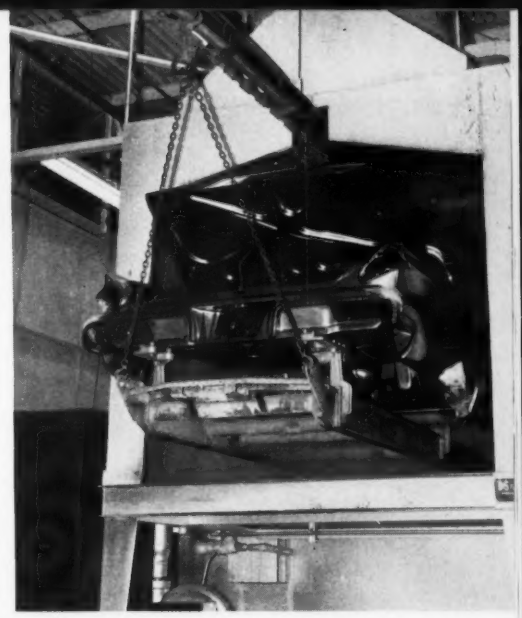
Top quality work takes precedence over all else in the new auto body finishing department at Ford Motor Company's Mercury-Edsel-Lincoln Division plant at Rivera, California. How strongly top quality work is emphasized can be illustrated by a single incident. While covering the plant, this writer noted that except for a few normal and obvious applications, no automatic spray guns were used in any of the paint booths. Plant officials were questioned about this lack of automation. The answer was blunt and to the point. . . . . "We are firmly convinced that on a contoured surface, such as that presented by the average auto body, a better job of spraying can be done by hand."

A second indication of this adherence to a principle is noticeable along the car repair line. The casual observer finds it hard to discover many of the slight defects which have caused Ford inspectors to reject bodies for rework.

A STAFF FEATURE by Gilbert C. Close • WESTERN EDITOR

Whether or not Ford officials are right in this assumption is beside the point. The fact remains that in this particular plant, management is ready to sacrifice speed in the interests of top quality work.

The body finishing department at Ford's M-E-L Rivera plant, some 280,000 sq. ft. in area, occupies the entire second floor of the building. When the skeleton bodies leave the first floor assembly line, they move without pause



Suspended on its pallet from an overhead conveyor, a body enters the 202-ft. long automatic washer and phosphatizing machine.

Spraying primer on a body in the prime booth. Farther along, sub-floor automatic spray guns will prime coat the underside.

EXCLUSIVE MPM PHOTOS

California plant

directly into an automatic elevator which lifts them to the second floor level. At this time, the bodies are already resting on a steel pallet where they will remain until they are ready for the final assembly line. The pallet conveyor in the elevator matches both the pallet conveyors on the first floor and the second floor so that no body shift is necessary. When the elevator reaches the second story level, the palletized bodies move directly onto the finishing line and begin their travel toward the automatic washer and phosphatizer.

Seven stage cleaning, phosphatizing machine

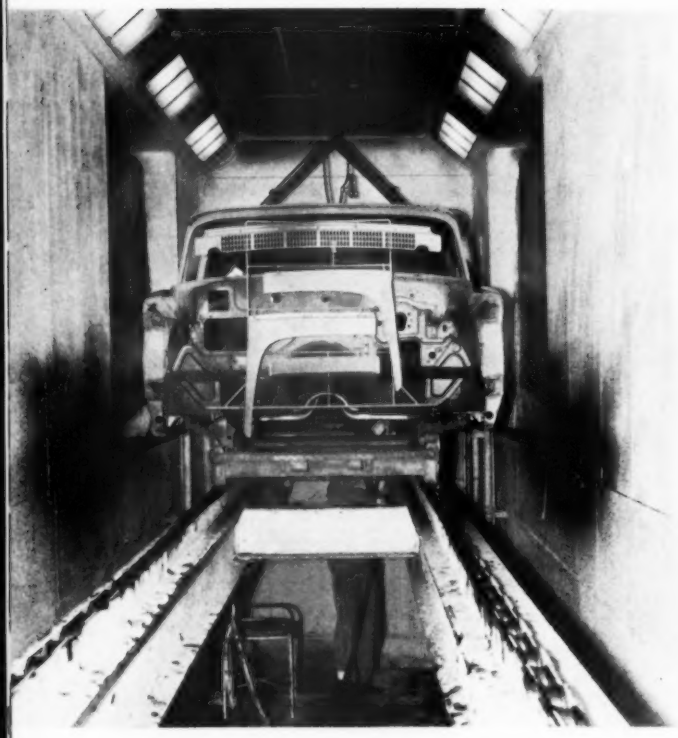
During the interval before the bodies reach the washer, they are wiped thoroughly to remove superfluous grease and dirt which might cause unnecessary washer solution contamination. Just before the bodies reach the automatic washer, the pallet is chain-hooked to the only overhead conveyor used throughout the body finishing line. The automatic washer and phosphatizing machine is 202 ft. in length, including the dry-off oven. It contains seven stages of operations as follows: — (1) Alkali cleaner operated at 155 degrees F.; (2) Hot water rinse at 160 degrees F.; (3) Hot water rinse at 110 degrees F.; (4) Phosphatizing solution at 120 degrees F.; (5) Cold water rinse at room temperature; (6) Phosphoric-chromic acid solution at 160 degrees F.; (7) A deionized water rinse. Treatment of the bodies through this chamber not only provides an excellent paint base, but because of the relatively heavy phosphate coating applied, will prevent metal rusting when deep scratches occur during the normal service life of the automobile.

Beyond the power washer and phosphatizing chamber, the bodies pass through a dry-off oven operated at approximately 380 degrees F. During the 40 minute cooling period beyond the dry-off oven, a pressure flow gun is used to apply an asphalt base sealer to all body joints. A putty glaze is used to smooth over all welded areas and other rough areas caused by grinding marks, tool marks, etc. These are both quick air-drying materials, and are firmly set before the body enters the prime booth.

Prime coat application combines hand and automatic

The body prime booth is a down-draft air conditioned enclosure, 110 ft. in length. As the palleted bodies, once again having been lowered onto the double-chain pallet conveyor, move into the booth, two operators, using hand spray guns, apply the prime coat to the upper portion of the body. This is followed by a surfacer coating to facilitate the No. 1 wet sanding operation and as-

An assembled body enters the elevator for its trip to the second-floor body finishing department.



As the body passes through this short, open-ended booth, under-coating material is applied from the workpit.

EXCLUSIVE MPM PHOTOS

sure a smooth base coat for the subsequent color coats. Just before the bodies leave the prime booth, they pass over sub-floor automatic spray units which prime the underside of the bodies. These sub-floor units are triggered into action by the passage of the body.

Beyond the prime booth, the bodies move into a gas-fired oven where the prime coat is baked for 30 minutes at approximately 350 degrees F. During the cooling period beyond this oven, the bodies move through a short, open-ended booth equipped with a work pit from which an undercoating is applied to the entire underside of the body. This coating serves both as a sound insulator, and to assure complete sealing and freedom from dust and air leaks.

Body sealing is followed by wet sand operation No. 1. Here the operator uses a water hose in one hand and No. 320 wet-or-dry silicon carbide paper in the other. All parts of the surfaced body are touched up in this operation, with emphasis on the rougher areas. Beyond the wet sanding line, the bodies pass under a cold water spray rinse which washes away all abrasive particles remaining on the surface. This is followed by a 15-minute pass through a dry-off oven operated at 275 degrees F. to prepare bodies for the first color coat.

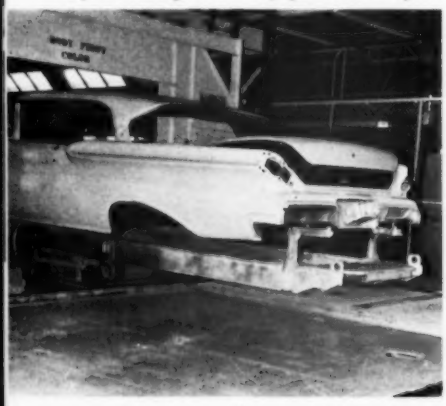
Automatic conveyor transfer

It should be noted at this point that the double-chain pallet conveyor lines in the M-E-L Division finishing department are each relatively short. As the body reaches the end of each line, it moves onto a second and wider double-chain pallet conveyor which moves at 90 degrees to the main line. This transfer conveyor transports the body sidewise across to the next line. This is accomplished automatically by means of motors and limit switches so that no personal attention is required to transfer the bodies from one line to the next.

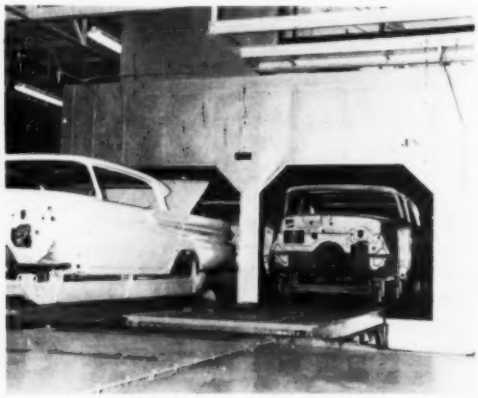
As already noted, all color coats are applied by hand spraying. Beyond the first color booth, the bodies are alternated into a twin-chamber bake oven where the enamel coating is baked for three minutes at approximately 265 degrees F. The twin-chamber oven serves to keep oven length at a minimum.

Wet sand operation No. 2 comes next. Here again, using water to supplement the operation, the bodies are sanded with a fine grit silicone paper to produce a glass-smooth sub-surface for the second color coat. The second color coat and bake is accomplished similar to the first, then the bodies move onto the final inspection line. At the end of this line the solid-color bodies which pass inspection move onward toward the trim department. The bodies scheduled to receive a two or three color job are shunted onto another conveyor which carries them into the masking department, and thence onward through a third paint booth where the various colors are applied. To facilitate the masking operation, always a bottleneck in any painting operation, paper of various widths, with masking tape al-

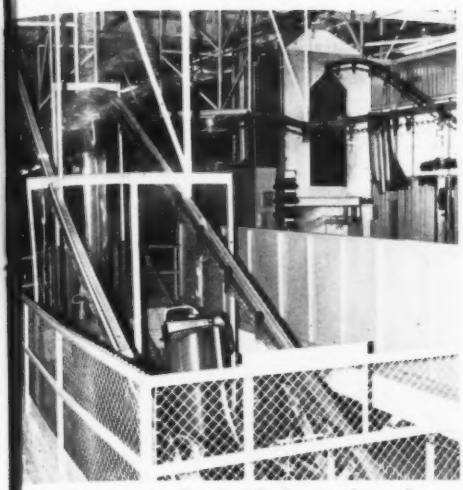
Primed, surfaced, and sanded body enters first-color booth after having been shifted into position by pallet conveyor.



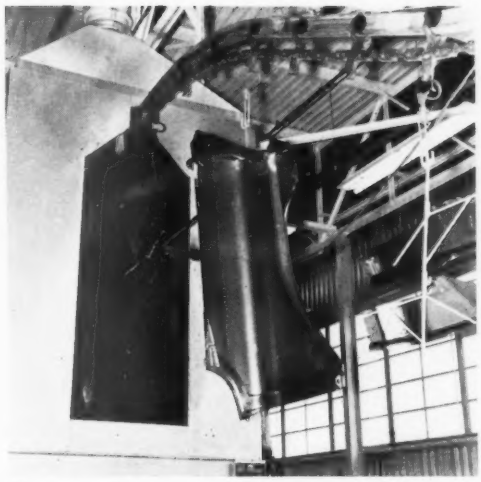
Bodies with first-color coat applied leave the twin-chamber enamel bake oven. Using twin chambers halves the length of the oven.



With two color coats applied, body goes to a third paint booth via conveyor for application of two- or three-color job.



Small parts to be finished are brought up from main floor on this overhead conveyor. Note part entering washer at upper right.



Here, small parts enter their own 182-ft. automatic washer and phosphatizing machine. Finishing sequence is same as for auto bodies.

Most of the small parts, unlike the hand-sprayed auto bodies, are coated in this large electrostatic paint booth.

ready applied to its edges, is available in rolls. It need only be unrolled and properly placed to form the mask.

Electrostatic spraying used for "small parts" prime coat

Small parts finishing sequences parallel those for the bodies. The small parts are conveyed up from the main floor, then pass through their own 183 ft. automatic washer and phosphatizing unit. The one difference in technique is that a large electrostatic spray booth is used for prime coating these parts. They have their own separate dry-off and baking ovens, and are handled by overhead conveyor from the time they enter the department until the descent to first floor level for final assembly.

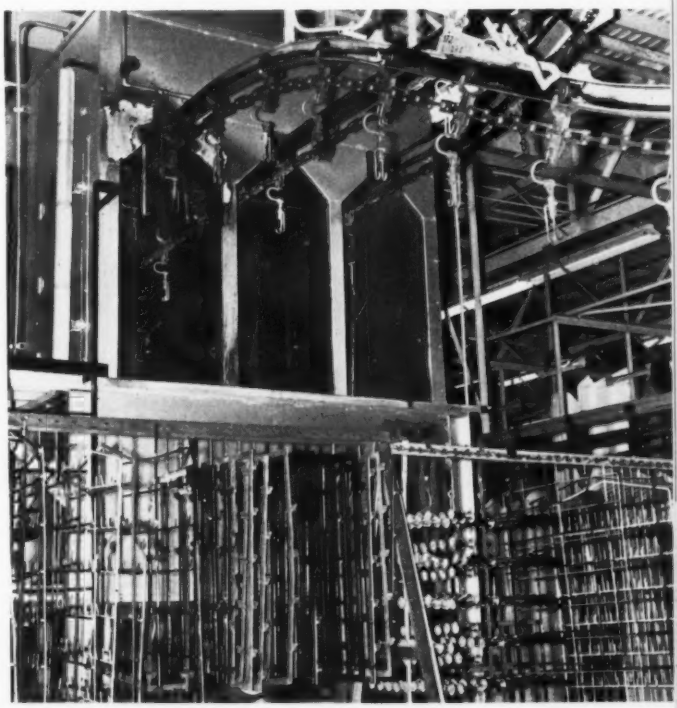
Tele-autograph control

A major feature of the new finishing departure—a feature that extends throughout the plant and along the final assembly line as well—is the system of tele-autograph control. Parts are scheduled for specific cars from the time they enter the system, and the tele-autograph control ascertains that each part will be at the right place at the right time. Thus if a body is scheduled for a two-tone job, no one has to follow through to make certain that this particular body will receive its two-color job. The information is originally fed into the tele-autograph, and when this particular body reaches that point on the finishing line where bodies are shunted aside for a two-color job, it will be automatically transferred to the correct conveyor.

When the body reaches the two-color booth, it has already been coded so that the operators can note immediately which colors to apply. Fenders are originally scheduled to be assembled with a specific car body, and when this body has been finished and delivered to the final assembly line, the fenders will descend on the small parts conveyor and join the body at the station where fender assembly takes place. On a plant-wide basis, the same degree of control and matching of components exists for chassis, engines, body, fenders, and various small parts which are influenced by model or color. As pointed out by company officials, this degree of production control is almost mandatory due to the numerous body models and color combinations used in automobile production today.

Thus, while the new M-E-L Division finishing department has foregone automation to a degree in some operations, the department is at the same time totally controlled by a system which seems almost to parallel the human brain in its function, with the added advantage that it never forgets.

EXCLUSIVE MPM PHOTOS



These three chambers are used for stripping paint from the conveyor hangers as they pass through. Hangers in lower foreground will be stripped as schedules permit.

FORTY-SECOND ANNUAL MEETING
AMERICAN HOME LAUNDRY MANUFACTURERS' ASSOCIATION
Boca Raton Hotel and Club
Boca Raton, Fla., April 20-22, 1958

SUNDAY, APRIL 20

2:30 P.M.
REGISTRATION

6:30 - 7:30 P.M.
OFFICERS' RECEPTION — INFORMAL

7:30 P.M.

BUFFET SUPPER — INFORMAL

MONDAY, APRIL 21
9:00-9:20 A.M. — Theatre Auditorium

OPENING CONFERENCE
For all members.
Opening remarks by Chairman Travis of AHLMA's Board of Directors.
Convention Chairman Hullsiek will introduce: AHLMA President Baumgart and Mr. C. Wilson Randle of Booz, Allen and Hamilton.

9:20 A.M.-12:30 P.M.

"KEY MANAGEMENT CHALLENGES IN 1958 AND 1959"
The convention will be divided into four seminar groups led by consultants of wide industrial experience in the field to be discussed. Each person will attend a discussion on each seminar topic once.

Seminar Topic A

"MANAGEMENT APPRAISAL AND DEVELOPMENT"
The evaluation of management personnel with a view to:
(a) Determining the most eligible candidates or backer-ups for key company positions.
(b) Providing sound basis for manpower planning.
(c) Identifying the management development needs to provide proper focus for training.

Seminar Topic B

"MANAGEMENT OF NEW PRODUCTS"
The planning, organization, and control of the total company activity involved in the selection and development of new products.

Seminar Topic C

"EFFECTIVE MANAGEMENT OF COSTS"
Consideration of basic alternatives to improve cost circumstances in an individual company—involves consideration of sales volume, new products and cost reduction.

Seminar Topic D

"ORGANIZATION PLANNING"
The basic principles of good organization—attuned to growth of the business and attainment of company objectives.

FIRST SEMINAR SCHEDULE:

9:20-10:20 A.M.
Presentation

10:20-10:30 A.M.
Intermission

10:30-11:00 A.M.
Question, Answer and Discussion Period

SECOND SEMINAR SCHEDULE:

11:00-12:00 A.M.
Presentation

12:00-12:30 P.M.
Question, Answer and Discussion Period

LUNCHEON — 12:30 P.M.
Polo Lounge or Cabana Terrace

2:00 P.M.
AHLMA Annual Golf Tournament
Score cards must be turned in to the committee by 6:30 P.M.

For Non-Golfers
Tennis, shuffleboard, croquet, horseshoe pitching, bowling on the green, riding, badminton, pingpong, beach sitting, two olympic size swimming pools.

8:00-11:00 P.M.

AWARDS DINNER AND STEAK ROAST ON THE BEACH — INFORMAL

TUESDAY, APRIL 22

8:30 A.M.
Board of Directors Meeting

9:20 A.M. - 12:15 P.M.

to Page 70 →

FICTION and FACT

FICTION:
R P Paint Arrestor Equipped Booths Cost More than other Methods of Paint Overspray Removal.

FACT:
Comparisons Show R P Paint Arrestor Booths' Operating Cost 30-50% Less than Water Wash Booths of Equal Size.

RP
PAINT ARRESTORS

Photo Courtesy American-Standard, Elyria, Ohio Plant

R P Paint Arrestors save money in other ways, too. Maintenance is simple—labor costs average 40 to 85% less than for equivalent water wash booths. Down-time is reduced considerably, production is increased, less floor space required. And, with all the savings, R P Paint Arrestors are more efficient—and adaptable to almost every type operation. Write for more information.

Products of Research

RESEARCH PRODUCTS Corporation
Dept. 39, Madison 10, Wis.

CUT COSTS BY USING
Coil Stock
WITH
Dahlstrom
FLYING CUT-OFF PRESSES

- *For rapid and accurate cut-off of roll formed metal shapes.*
- *Enables use of coil stock in place of cut lengths.*

Operating speeds of 240 or 300 R.P.M. 4 to 120 ton capacity.
Flag trip or positive mechanical run-out table to suit your needs. Simplified adjustment of height and lateral requirement.
Mechanical clutch on 4 ton units. Air clutch and air brake on 8 to 120 ton units.
Furnished complete with necessary upper and lower die slide and bolster plate. All welded, heavy-duty construction.
Send us your problem. Give tonnage, stroke, maximum width of section, cutting length, pass line dimensions and tolerances required.

Dahlstrom **MACHINE WORKS**
INCORPORATED

Roll forming machines, flying cut-off presses, coil reels, coil lifts, roll straighteners, press feed lines, decoiling and shearing lines.
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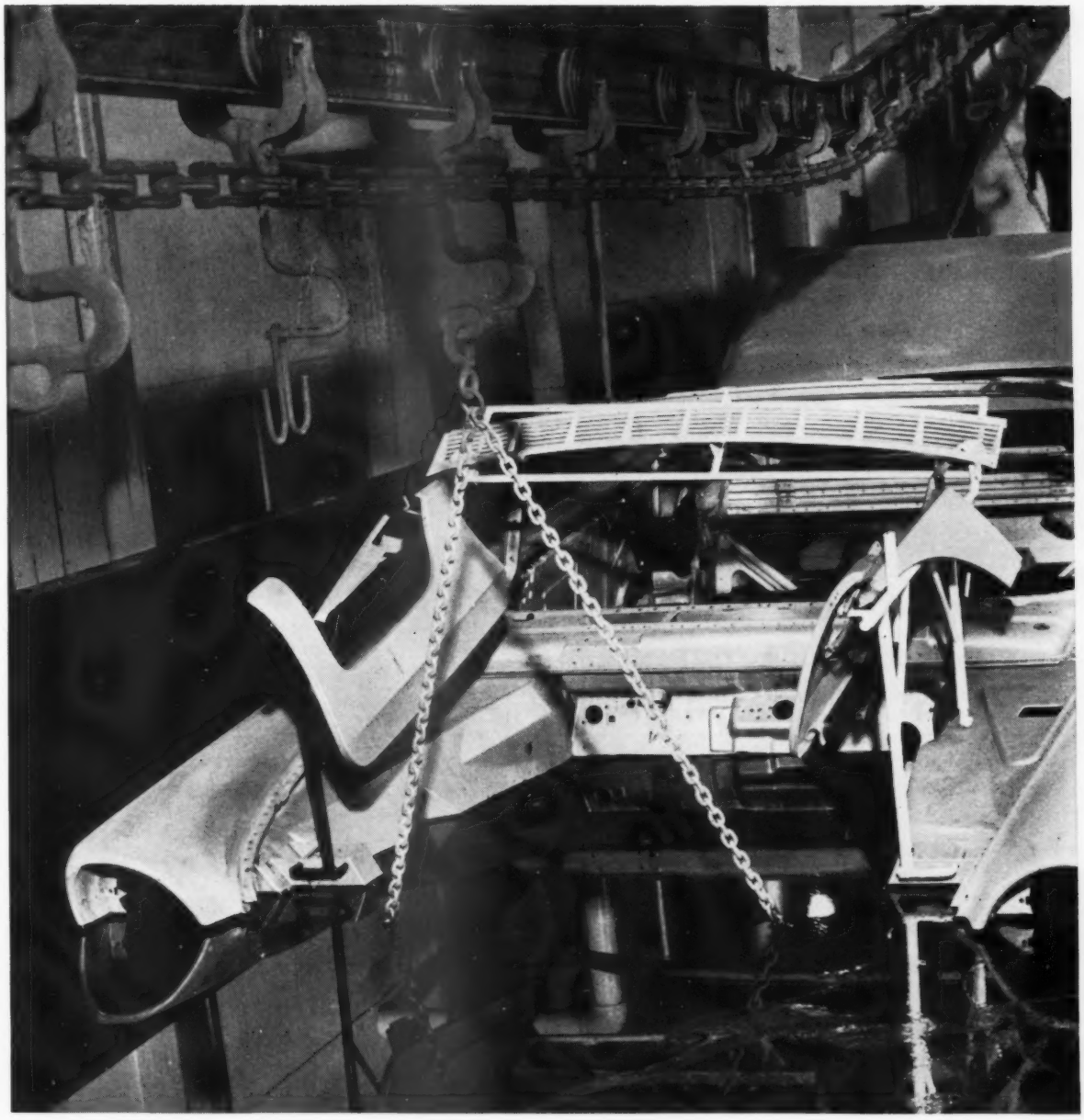

Lincoln chooses latex primer for rust-preventive bath!

In the war against rust, '58 Lincoln auto bodies get extra protection with a dip-painting in latex paint for metal.

Even salt spray can't get through to corrode metal protected with a latex finish. But Lincoln gets more than auto body protection with latex. Metal finishes made with latex eliminate fire hazard and expensive solvent recovery systems because water replaces flammable solvents. Disagreeable odors are reduced. Safer working conditions and lower insurance rates are additional benefits. And these new paints may be used without changing your present systems.

Why wait? Ask your supplier now about these new water-thinned paints formulated with Dow Latex, or write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department **2149R-1.**

LATEX T.M.

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REFRIGERATOR SHELVING 50,000 PIECES AVAILABLE FOR IMMEDIATE DELIVERY

We have on hand 50,000 pieces of refrigerator shelving in 14 sizes, all brand new and in perfect condition. Outside frame is ¼" diameter rod; with ⅛" rod at ¾" intervals over frame. Entire unit zinc plated, dicromate dipped and lacquered. Concave chrome decorative strip ½" wide along front edge, with one inch high wire stop at back.

Can be used as racking for any type of display racks in hardware and garden supply stores. 14 sizes, 22⅜" deep by following widths: 11⅝", 14⅝", 17⅝", 20⅝", 23⅝" and 26⅝". 11-5/16" deep by following widths: 14", 17", 20", 23", 26", 29", 35" and 43".

Will sell any quantity, prices will vary with amount needed and distance to be shipped. Will guarantee the price is right.

CONTACT DEPT. S-101

AMERICAN APPLICATOR COMPANY
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★ Our master toolmakers are "Scottish" when it comes to Time and Materials. They'll produce precision, all-steel dies for you in half the time and at half the price you'd pay for conventional dies.

On runs of 250,000 pieces, "Scottish Dies" do a beautiful production job of piercing and blanking and hold tolerances of .005". "Scottish Dies" are easy to set-up, easy to revise for engineering changes. Get "Scottish" for FASTER DELIVERY and bigger profits this year.

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Positive product identification must meet exacting specifications for beauty, durability, and design flexibility. LaFrance specializes exclusively in three-dimensional die cast name plates and decorative trim — with complete design and production facilities. Send for free sample and additional information.

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A progress report . . . . .

Porcelain enamels on aluminum

this report includes comment on aluminum alloys, mill additions, metal preparation, drying and firing

by Karl Kautz • VITRO MANUFACTURING COMPANY

MPM EXCLUSIVE FEATURE

Progress in the formulation and application of porcelain enamels for aluminum has been encouraging during the past year.

The volume of business in this field, predicted recently by some authorities, has not been reached. However, new entrants into aluminum enameling are being recorded each month, indicating a slow but steady rise in this comparatively-new endeavor.

Not only are enamels being applied successfully to wrought 3003 and 6061 aluminum alloys, but aluminum castings and aluminized steel are becoming more important items. Aluminum alloys 2024, 5052, and 7075 (the high strength alloys) are now being successfully enameled for various uses. Lower fusing enamels must be used for these alloys. Many conventional enamels have a tendency to craze on aluminized steel, due to their high coefficients of expansion (below 125 x 10^{-7} linear), or by milling large amounts of inert materials into the mill batch of regular frit so as to lower the expansion.

Importance of mill additions

One of the most promising fields of investigation has been mill additives. It has been found that the physical properties of fired aluminum enamels can be varied greatly by mill additions. In one example, a lead-bearing frit which consistently had a boiling citric acid loss of 18 mg. per square inch with one set of mill additives, was reduced to a loss of 2 to 4 mg. per square inch when an entirely different combination of compounds was used. In another case, a lead-free, non-toxic frit, when milled with customary mill additions, had a boiling citric acid loss of 33 mg. per square inch, but this was reduced to a loss of about 11 mg. per square inch when entirely new and different mill additions were used in the mill. In another case, blistering on aluminized steel was overcome by changing to entirely different combinations of mill additions. The pH of the milled enamel liquor seems to be important, and should be maintained at 11.0 ± 0.5. Above and below this range, metal reactions and tearing often occur.

A typical mill batch which gives good results is:

Aluminum enamel frit	100
Anti-tear frit (8173-E)	3 to 6
Titania	0 to 10
Color	0 to 6
Water	40

Grind: 0.1 to 0.3 gms./325 M./50cc.

Sometimes 2 per cent of Sodium Silicate (N Brand) or Potassium Silicate (Kasil No. 6) may be added advantageously to the above batch. However, both have a tendency to decrease fusibility, and their use should be limited to small amounts. Suspending agents, such as Ben-A-Gel, may be used in very small amounts. It is not wise to use more than 0.25 per cent of this additive because of the danger of tearing.

The above examples illustrate how important mill additions are in porcelain enamels for aluminum. There are no standard additions because a great variety of combinations of compounds can be used. A research program to evaluate all possible mill additions would be a long-range and time-consuming operation. Not only would it be necessary to investigate perhaps dozens of different chemical compounds and minerals, but also their effect in various combinations and concentrations. Short-cut methods have shown workable combinations that give good results.

Metal preparation an "open field"

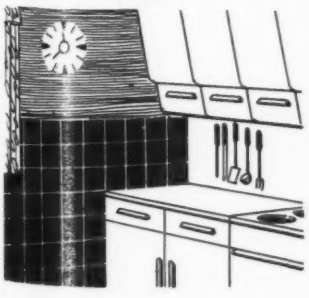
The field of metal preparation for application of porcelain enamels to aluminum is likewise an open field. Much work has been done, and a great amount is likely, before any sort of standardized procedure is established. Different alloys require different treatments so that a standardized treatment would be difficult to adopt. Simple prefiring to remove grease, oil, and fingermarks suffices for some alloys, notably

to Page 82 →

EDITOR'S NOTE: It is a long-standing editorial policy at MPM that manufacturers' names or trade names for proprietary materials are avoided in feature plant articles. A concession was made in connection with this brief article, as it was the feeling that to hold to the letter of the policy in this instance would at least partially destroy the value of Mr. Kautz' progress report.

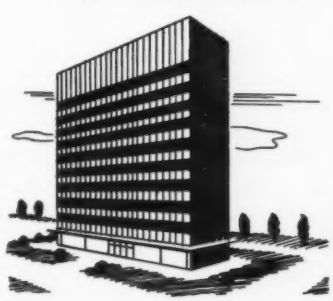
TYPICAL APPLICATIONS

FOR TILE

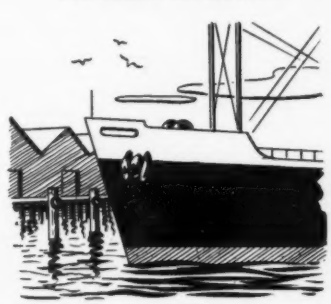


FOR HOUSEWARES

FOR ARCHITECTURAL PANELS



FOR MARINE APPLICATIONS



INDUSTRY PERSONALS

D. R. Thayer, general plant superintendent, Ingram-Richardson, Inc., Frankfort, Ind., died Wednesday, March 12, en route from Mexico City to Chicago. He was returning from a vacation in Acapulco with his wife, sister and brother-in-law.

Mr. Thayer was 50 years old and had been with Ing-Rich in various capacities for 30 years, plant superintendent for the last 8 years.

The promotion of three sales executives was announced by Judson S. Sayre, president, Norge Div., Borg-Warner Corp., Chicago.

Harold P. Bull has been appointed vice president of sales; **Walter C. Fisher,** director of distribution; and **James D. Dougherty,** national field sales manager.

James A. Erdle has been appointed chief engineer by Johnson & Hoffman Manufacturing Corp., 31 East Second St., Mineola, N. Y.

Previously, Erdle was manufacturing superintendent of Sylvania Electric Product Company's Warren, Pa., plant for the production of lamp parts.

James W. Vicary, president of Ervite Corp., Erie, Pa., recently announced the appointment of **Hugh J. Schultz** as assistant to the general manager. Schultz came to Ervite Corp. from the Erie Division of Bucyrus-Erie Co., where he was employed the past eleven years. His most recent position with Bucyrus-Erie was that of supervisor of industrial relations.

In his new capacity as assistant to Rush S. Dale, vice president and general manager, Schultz will be primarily responsible for production control and quality control in the concern.

ERDLE

SCHULTZ

The appointment of **Peter Humeniuk** as manager — engineering of General Electric's Television Receiver Department has been announced by Herbert Riegelman, department general manager.

Ronald N. Campbell, formerly president of the Bryant Manufacturing Co., a division of the Carrier Corp., Indianapolis, Ind., has been elected a vice president of the Westinghouse Electric Corp. and president of its wholly-owned subsidiary, the C. A. Olsen Manufacturing Co., Elyria, Ohio.

Promotion of **Victor T. Koozin** to the newly-created post of engineering manager of Waste King Corporation's Technical Products Division, Los Angeles, was announced recently.

Howard C. Given, executive vice president of Waste King, simultaneously announced promotion of **Dr. Arthur J. R. Schneider** and **Earl Finkle** to chief mechanical engineer and chief ordnance engineer, respectively, and appointment of **Gardner L. Mason** as quality control manager.

Election of **Harry P. Troendly** as a group vice president of Borg-Warner Corp. was announced by Roy C. Ingersoll, chairman of the board.

Troendly comes to the Borg-Warner central office management group from the corporation's Spring Division, of which he has been president since 1953. Prior to that he was vice president and general manager for 13 years, dating back to 1940 when he first organized the division.

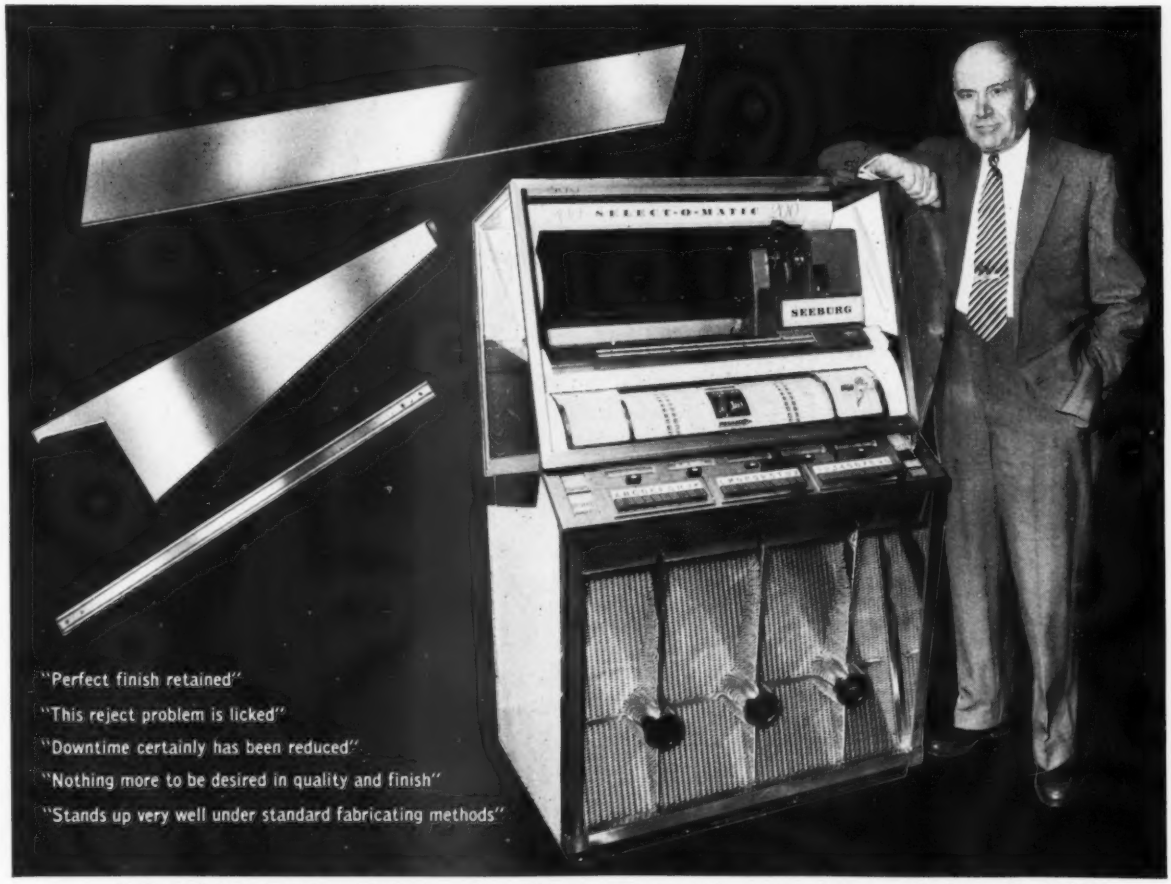
Frederick A. Sincock has been named manager for domestic water heaters manufactured by the Plumbing and Heating division of American-Standard.

According to Robert W. Lear, general marketing manager for the division, creation of this position reflects increased marketing emphasis for the full line of gas and electric water heaters recently introduced by American-Standard.

Samuel F. Shawhan has been elected president of Bryant Mfg. Co., Indianapolis, a division of Carrier Corp. Shawhan will succeed Ronald N. Campbell who has resigned. The announcement was made by Lyle C. Harvey, Carrier senior vice president.

New automatic hydraulic scrap shear

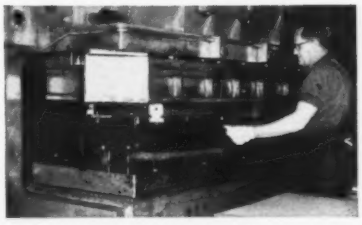
THE machine weighs about 335,000 pounds, is two and one-half stories high, and is rugged enough to take the punishment of full time outdoor operation. The scrap shear will cut almost any kind of heterogeneous scrap into equal lengths, adjustable in 6 inch increments from 6 to 48 inches. It will develop 600 tons pressure and cut up to 30 tons of scrap per hour. A magnetic yard crane loads the hopper (left rear of photo) with scrap. The hopper is hydraulically elevated, dumping the contents into the feed box. A lid closes on the feed box and the hopper automatically returns to its original position. The hydraulic ram in the feed box moves forward a pre-set distance equal to the length of cut, pushing scrap under the shear blades. A 100-ton hold-down device locks down, holding the scrap firmly in place. Then the shear slide is automatically actuated, shearing the scrap charge. The shear slide rises, hold-down pressure is released, and the ram moves forward to start another cycle. It is understood that scrap that has been sheared in this method commands a far better price from steel companies. Any readers who are large fabricators of steel, and who feel they would be interested in a much smaller capacity scrap shear, are urged to contact Ervin Baumrucker, Dept. MPM, Clearing Machine Corp., 6499 W. 65th St., Chicago 38, Ill., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.


"Perfect finish retained"
"This reject problem is licked"
"Downtime certainly has been reduced"
"Nothing more to be desired in quality and finish"
"Stands up very well under standard fabricating methods"
SEEBURG

K. R. Craft, Vice President, The Seeburg Corp., Chicago, with one of the company's famous juke boxes. The brilliant reflectivity and durability of Nickeloid pre-plated metals is an important factor in the product's eye-catching good looks.

NICKELOID METALS SAVE 4 PRODUCTION STEPS— REDUCE REJECTS FOR THE SEEBURG CORPORATION

Standard fabricating methods are used to stamp and form juke box trim. Nickeloid Metals eliminate machinery tie-up; rejects are less than 1%.



Stamping Nickeloid chrome steel, protected with Mar-Not adhesive-backed paper which is easily peeled off. Finished part will need no polishing.

Pre-Finished Design Material is Easily Worked With Standard Fabricating Methods

The Seeburg Corporation uses Nickeloid *pre-plated* chrome steel to achieve functional beauty and attention-value . . . economically. Before switching to Nickeloid, the company did its own cleaning, plating and buffing. The job required four — sometimes five more operations than are now necessary. According to Mr. Craft, "The tremendous cost of plating and buffing was not only more expensive and much more time consuming, but the finished product had to be inspected, and the rejections on plated and buffed metals was very much higher than it is with Nickeloid. Economically, the Nickeloid Metals have proved themselves in production."

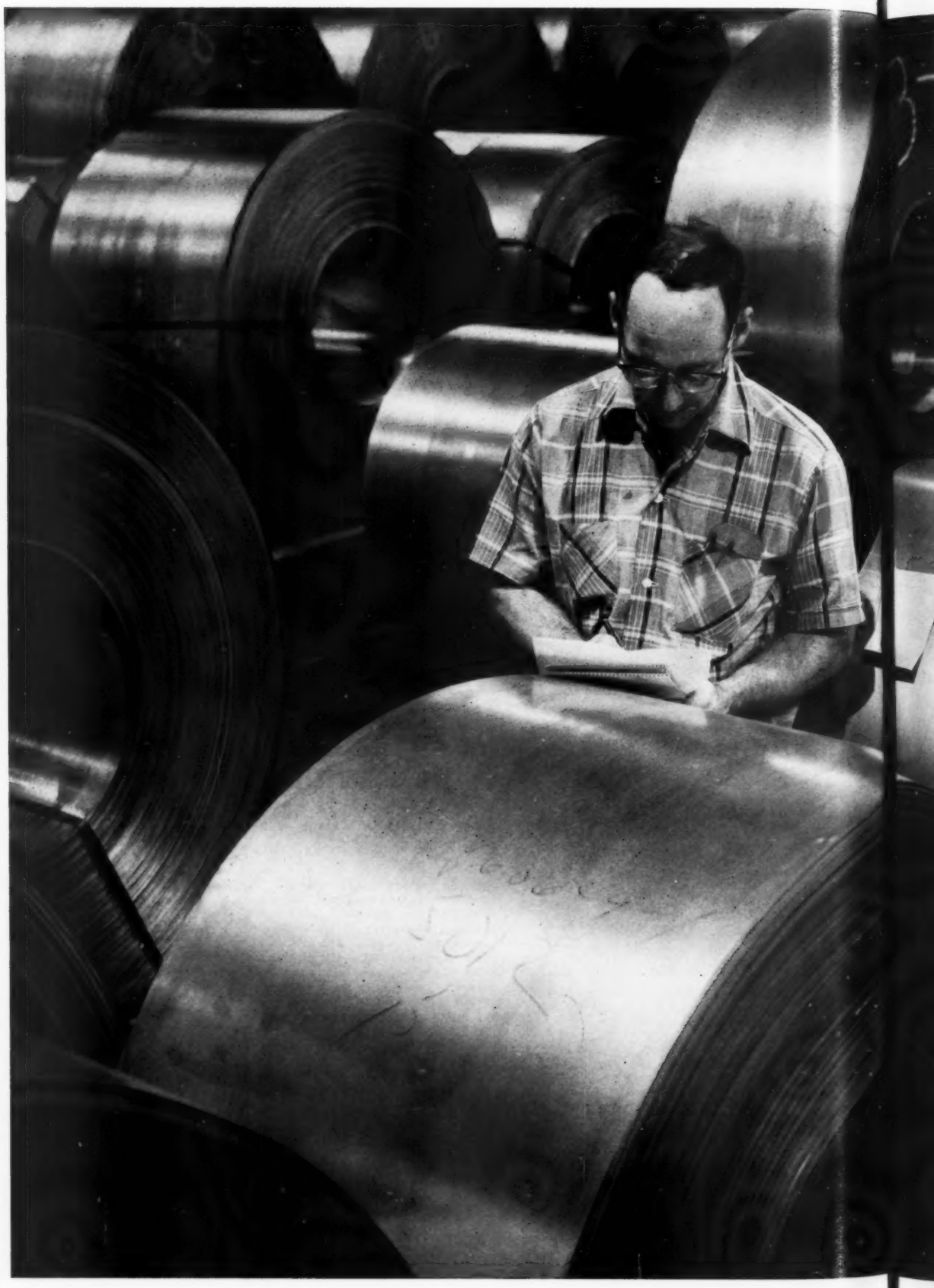
Using standard fabricating methods, Nickeloid Metals need only be stamped and formed — then assembled. By capitalizing on this pre finished *method* of production, this leading manufacturer has eliminated the machinery formerly required for plating, polishing and buffing — saved four or five production steps, and is producing a better end product *with less manpower.* Can you use these advantages in *your* operation?

AT THE DESIGN ENGINEERING SHOW — SEE NICKELOID METALS, BOOTH 103-A

WRITE TODAY FOR FREE LITERATURE

NICKELOID METALS SINCE 1898

AMERICAN NICKELOID COMPANY
PERU 11, ILLINOIS



A metalworking first

USS Vitrenamel enameling steel in coils!

For the first time normalized enameling steel is available in coils. Here's why this new development is important to you:

1. **Coils cost less than flat, pre-cut lengths.**
2. **There's less inventory. You don't have to stock a wide range of sizes because your own machinery can cut the coils to any length and slit to any width.**
3. **The coils can be set up on feeding mechanisms for time-saving automatic production.**

Because USS Vitrenamel is highly ductile, it is easy to fabricate . . . easiest of all, say some of our customers.

USS Vitrenamel is available in coils from 16 to 22 gage, 24″ to 60″ wide, and up to 50,000 lbs. coil weight. Of course, it is still available in cut lengths.

USS and Vitrenamel are registered trademarks

United States Steel Corporation–Pittsburgh
Columbia-Geneva Steel–San Francisco
Tennessee Coal & Iron–Fairfield, Alabama
United States Steel Supply–Warehouse Distributors
United States Steel Export Company

United States Steel

$2,500,000 Display of Welding Equipment at AWS Meeting

A $2,500,000 display, the largest collection of welding equipment and accessories ever gathered under one roof, will be unveiled at Kiel Auditorium, St. Louis, Tuesday, April 15, for a three-day showing.

The exposition, sponsored by the American Welding Society, with 128 companies participating, is expected to break all previous records for size. It will cover an area of 33,664 square feet, an area which exceeds the record-breaking size of the 1957 show in Philadelphia.

Westinghouse 1,000,000th Electric Dryer Produced

On March 5th, Westinghouse Electric Corp., Mansfield, Ohio, produced its 1,000,000th electric clothes dryer — almost to the day 10 years after the company built its first model.

Jack D. Lee, manager of the Westinghouse laundry equipment department, at ceremonies noting the event, pointed out that Westinghouse has produced one out of five of the 5,000,000 electric dryers in use in the nation today.

Appliance Technical Conference will be of Importance to all Engineers in Appliance Industry

The 1958 AIEE Appliance Technical Conference, scheduled for the Morrison Hotel, Chicago, Ill., May 26-27, is going to be a "must" meeting for all engineers in the appliance industry. Here are some of the subjects scheduled for the meeting on the proposed program: "Higher voltage & grounding — an appliance problem," "Electrified fibrous air filters," "Water and appliances," "A new look at engineering kitchen appliances," and "Standardization of pre-shipment testing of packaged products through the National Safe Transit Program."

Noise level in major home appliances is considered by many management men and engineers as one of the most important considerations in appliance design for homes of the future. Based on early interest, the Sub-Committee sponsoring the program feels that this subject will be one of importance to practically every one of the several hundred engineers who are expected to attend the conference in May.

The Appliance Technical Conference is open to all engineers in the appliance industry, irrespective of whether or not they are members of AIEE. Any engineers in the industry who would like additional information on the conference should write direct to D. C. Krammes, Chairman Sub-Committee on Domestic Appliances, American Institute of Electrical Engineers, c/o The Hoover Company, North Canton, Ohio.

Design Engineers Meet in Chicago April 14-17

Advance registrations and inquiries indicate that 20,000 of the nation's design engineers and product development executives will be present at the Design Engineering Show in Chicago, April 14-17, to inspect the exhibits of 410 companies, according to Clapp & Poliak, Inc., New York exposition management firm, which produces the show.

The show, which has been held previously in Philadelphia and New York, will be produced in Chicago for the first time. Its growth since the first show in 1956 is said to be the most spectacular in the history of industrial expositions in this country.

Exhibits are scheduled to cover an area of 125,000 square feet, making it four times the size of the first show and 50 per cent larger than the second. It promises to be one of the largest annual industrial expositions held in 1958.

More than 4,000 technical experts will be on hand to answer visitors' questions. The visitors will be from companies making products ranging from those for everyday household use to those who design earth satellites and atomic reactors. Exhibits will include mechanical, electrical, electronic, hydraulic, and pneumatic components of all types; power transmission equipment; all kinds of materials; fasteners and adhesives; finishes and coatings; shapes and forms, and accessories to product development.

Concurrently with the show, the machine design division of the American Society of Mechanical Engineers will conduct a four-day Design Engineering Conference at the Amphitheatre.

Visitors who wish to receive hotel and conference information and advance registration cards may obtain them by writing Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N.Y.

Dictaphone '57 Sales Hit All-Time High

Dictaphone Corp. and its subsidiary, Dictaphone Corp., Ltd., set an all-time sales record in 1957, the ninth successive year it has recorded a gain in total net sales, according to C. K. Woodbridge, chairman of the board and chief executive officer, in the thirty-fourth annual report to stockholders, employees, and customers.

Sales of dictating machines, service and accessories, including defense contracts billed, totaled $36,033,039, compared to $35,251,850 in 1956. Net earnings were $2,544,690, or $4.38 a common share, as against $2,760,431 or $4.75 a share, in 1956. Cost of goods sold and operating expenses (including depreciation of $552,511) totaled $31,067,084, whereas in 1956 it came to $29,424,668 (including depreciation of $408,931).

Trane Reports '57 Sales, Profits

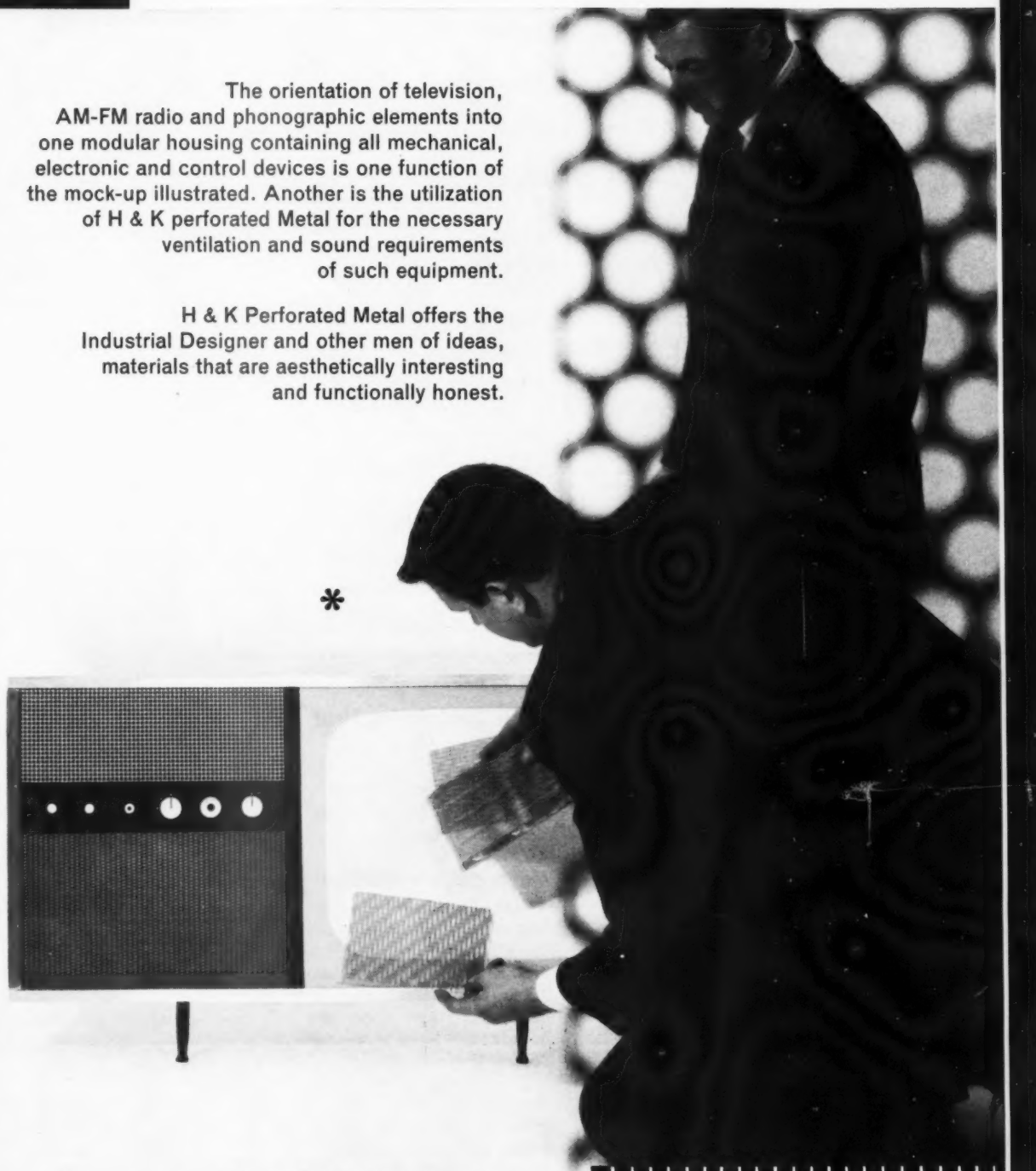
The Trane Co., manufacturing engineers of air conditioning, heating, ventilating and special heat transfer equipment, reported record 1957 year-end figures showing total sales up 8.3 per cent, and profit 8.8 per cent ahead of 1956. Consolidated sales increased from $74,444,000 in 1956 to $80,648,000 in 1957. Profit moved up to $6,244,000.

Idea!

H & K perforated metals serve a function of design

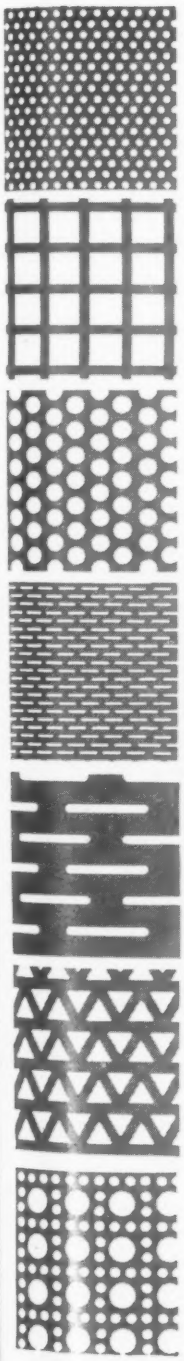
The orientation of television, AM-FM radio and phonographic elements into one modular housing containing all mechanical, electronic and control devices is one function of the mock-up illustrated. Another is the utilization of H & K perforated Metal for the necessary ventilation and sound requirements of such equipment.

H & K Perforated Metal offers the Industrial Designer and other men of ideas, materials that are aesthetically interesting and functionally honest.



*

If perforated materials can be utilized in your product, please contact us. Our sales engineers will be pleased to work with you.



A few of the many H & K Patterns available.

Fill in and mail coupon to nearest H & K office

*Product Development by William M. Schmidt Associates.

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DESIGN FOR A FAN

CIRCUIT BREAKERS — TYPES AND USES IN THE APPLIANCE INDUSTRY

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AUTOMATIC WELD ROLL PLANISHING MACHINES SPEED CONTAINER PRODUCTION

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NEW PORCELAIN ENAMELING PLANT AT DAY & NIGHT DIVISION, CARRIER CORP.

GENERAL

NEW APPLIANCE PLANT FEATURES AUTOMATED MATERIALS HANDLING

SPECIAL SECTION DEVOTED TO AUTOMATIC MERCHANDISING MACHINE INDUSTRY

PRODUCTION

PRODUCTION OF VENDING MACHINES BY THE WORLD'S LARGEST PRODUCER

386-page Book on Stainless Steel Fabrication

A new 386-page hard-backed book on the fabrication of stainless steel is now available. The book, entitled "Stainless Steel Fabrication," has more than 140 photographs, 120 charts and graphs, and about 200 special diagrams. There is a complete section of almost 30 special reference tables on stainless steels. A detailed index for cross reference purposes is included.

Included in the nine chapters are such chapter headings as: cutting operations, joining operations, cold forming operations, hot forming operations, machining operations, heat treating operations, surface treating operations and others.

For your copy write: Readers Service Dept., MPM, York St. at Park Ave., Elmhurst, Ill.

AHLMA meeting

→ *from Page 60*

"KEY MANAGEMENT CHALLENGES IN 1958 AND 1959"

THIRD SEMINAR SESSION

9:00-10:00 A.M.
Presentation

10:00-10:30 A.M.
Question, Answer and Discussion Period

10:30-10:45 A.M.
Intermission

FOURTH SEMINAR SESSION
10:40-11:45 A.M.
Presentation

11:45-12:15 P.M.
Question, Answer and Discussion Period

LUNCHEON — 12:15 P.M.

INFORMAL RECREATION 2:00 P.M.

7:00 P.M.
RECEPTION

8:00 P.M.
Patio Royale

BANQUET — FORMAL
Entertainment and dancing courtesy of AHLMA associate members. Ladies Gifts.

NEWS

Trane to Enter Home Air Conditioning Field

The Trane Company, La Crosse, Wisconsin, manufacturer of air conditioning and heating equipment, will enter consumer market for home air conditioners this summer.

Maytag Ups Production

Due to a backlog of orders, a 20 percent increase in the production rate on the All-Fabric automatic washer assembly line at the Maytag company's Plant 2 has been announced. Attributed to unusually rapid acceptance of new models introduced at yearend, the production increase brought about a resulting increase in employment, officials said.

PFMA Officers Installed

The newly-elected officers of the Plumbing Fixture Manufacturers Association were installed at a meeting recently at Philadelphia. Stanley S. Backner, vice president of the Universal-Rundle Corp., New Castle, Pa., presided for the first time as Chairman of PFMA. Installed with Backner were Lawrence A. Drouhard, assistant general manager and secretary-treasurer of Mansfield Sanitary Pottery, Inc., Perrysville, O., as vice chairman; and Albert G. Zibell, plumbing & heating sales manager of Kohler Co., Kohler, Wis. as treasurer. William E. Kramer, Washington, D. C., is permanent secretary of the Association.

Whirlpool Canada Opens New Offices

The headquarters office of Whirlpool Appliances Canada, Ltd. has been opened in the Royal Bank Bldg., Toronto, Ontario, it was anounced by Robert M. Mitchell, vice president, Whirlpool Corp. The service and parts office is at 10 Jeavons Avenue, Toronto 13, Ontario. Officers of the new company are Robert E. Lake, president, Robert P. Lewis, vice president, and Roy Erikson, secretary-treasurer.

NAAMM Convention in Houston

The 20th annual convention of the National Association of Architectural Metal Manufacturers will be held April 27-May 2, 1958 at the Shamrock-Hilton Hotel, Houston, Texas. Among the guest speakers at this convention will be:

Monday, April 28, 12:00 Noon — Dr. George Cline Smith, vice president and economist, F. W. Dodge Corp., New York, N. Y. — "How Big is the Building Future?"

Tuesday, April 29, 12:00 Noon — Harry A. Stuhldreher, assistant to vice president of United States Steel Corp.— "Learn and Live."

Tuesday, April 29, 2:30 P.M. — William H. Scheick, executive director, Building Research Institute, Washington, D. C. — "Building Research."

Architectural Forum magazine will present the film "The New Age of Architecture" Wednesday morning, April 30, and United States Steel Corp. will present the film "The Chicago Dynamic Story" Wednesday morning, April 30.

Rise in Shipments of Aluminum Sheet, Plate and Foil

January 1958

Net Shipments of Aluminum Sheet and Plate (pounds) reported by the Aluminum Association

	January 1958	December 1957
Total	88,251,000	75,962,000
Non-Heat-Treatable	72,237,000	62,700,000
Heat-Treatable	16,014,000	13,262,000

*Includes shipments of 9 companies.

150,000 Glass Lined Water Heaters *without a single failure*

One of our customers was very happy to report this splendid production record to us recently.

Our No. 700 Water Heater Enamel is the answer . . .

The result of that all-important "KNOW-HOW" which comes from exhaustive laboratory research by our top flight ceramic engineers, working hand in hand with practical technicians, under actual production conditions in our own large job enameling plant.

ING-RICH "KNOW-HOW"

has enabled us to produce this superior *FRIT* for Glass Lined Water Heaters, which provides:

1. **Greater Water Resistance**
2. **Less Porosity**
3. **Higher Percentage of One-Coat Applications**
4. **Wider Range of Firing Temperatures**
5. **More Workability**

Ing-Rich plant-tested ceramic engineers and plant-tested Frit can give you the results *you* want—there is no substitute for "Know-How."

INGRAM-RICHARDSON, INC.
Offices, Laboratory and Plant
FRANKFORT, INDIANA

ING-RICH
FRIT
"The Plant Tested Frit"

NEWS about Suppliers

Ranco Looks to the Future At Florida Research Center

Ranco Incorporated figures 1960 will be the completion date at their research center in the sunny southland. Development techniques, research projects and advanced tests at the center run as much as two years ahead of production, according to A. M. Hoover, president of the company.

To provide working space for its rapidly-expanding research operations, Ranco is now constructing a new research center on a recently-purchased 3-acre tract five miles north of Fort Lauderdale in a new, highly-industrial development. The new building was necessary because of the increase in research and development activities and because Ranco plans to increase its Fort Lauderdale staff. The new architect-designed center has also been planned to eliminate a few shortcomings in the present building as well as providing planned space for the increased facilities and personnel with ample space provided for future expansion.

Application Forms for Spray Painting School

Revised application forms for the DeVilbiss School of Spray Painting are now available from the company.

Special schools in industrial product finishing, maintenance painting, general refinishing, service training, automotive jobber and portable equipment jobber personnel, are offered.

The week-long classes are held at the factory in Toledo, Ohio, with the daily sessions running from 8 a.m. to 5 p.m. Eligible are owners or sellers of DeVilbiss equipment or their representatives or operators. There is no fee, and equipment and materials are furnished. The student must, however, meet his own transportation and living expenses.

The school is maintained as a service to users and distributors to increase their knowledge of the operation and use of the company's products. For those who are unable to arrange a trip to Toledo for training, the company conducts a number of field schools each year, and information about them can be obtained from the Education Department, DeVilbiss Co., Toledo 1, Ohio.

Armco and National Supply Merger to Stockholders

R. L. Gray, president of Armco Steel Corp., and A. W. McKinney, president of The National Supply Co., announced recently that a joint plan and agreement of merger between Armco and National Supply has been executed. The proposed merger of National Supply into Armco will be submitted to stockholders of both companies at meetings to be held April 16th and 17th, respectively.

The plan provides for the transfer of National Supply's assets to a new subsidiary prior to the merger, after which the business of National Supply will be conducted in that name with substantially the same personnel, the report states. Under the merger agreement, stockholders of National Supply will receive 85/100 share of Armco stock for each share of National Supply. It is planned to make the merger effective April 30th.

Federal Machine Acquires B-D Welder Line

The Federal Machine and Welder Co., Warren, Ohio, manufacturer of resistance welding machines and Warco mechanical presses, has acquired control of the Berkeley-Davis line of automatic arc welding machines.

Federal, Berkeley-Davis affiliation now offers a complete line of resistance and automatic arc welding equipment.

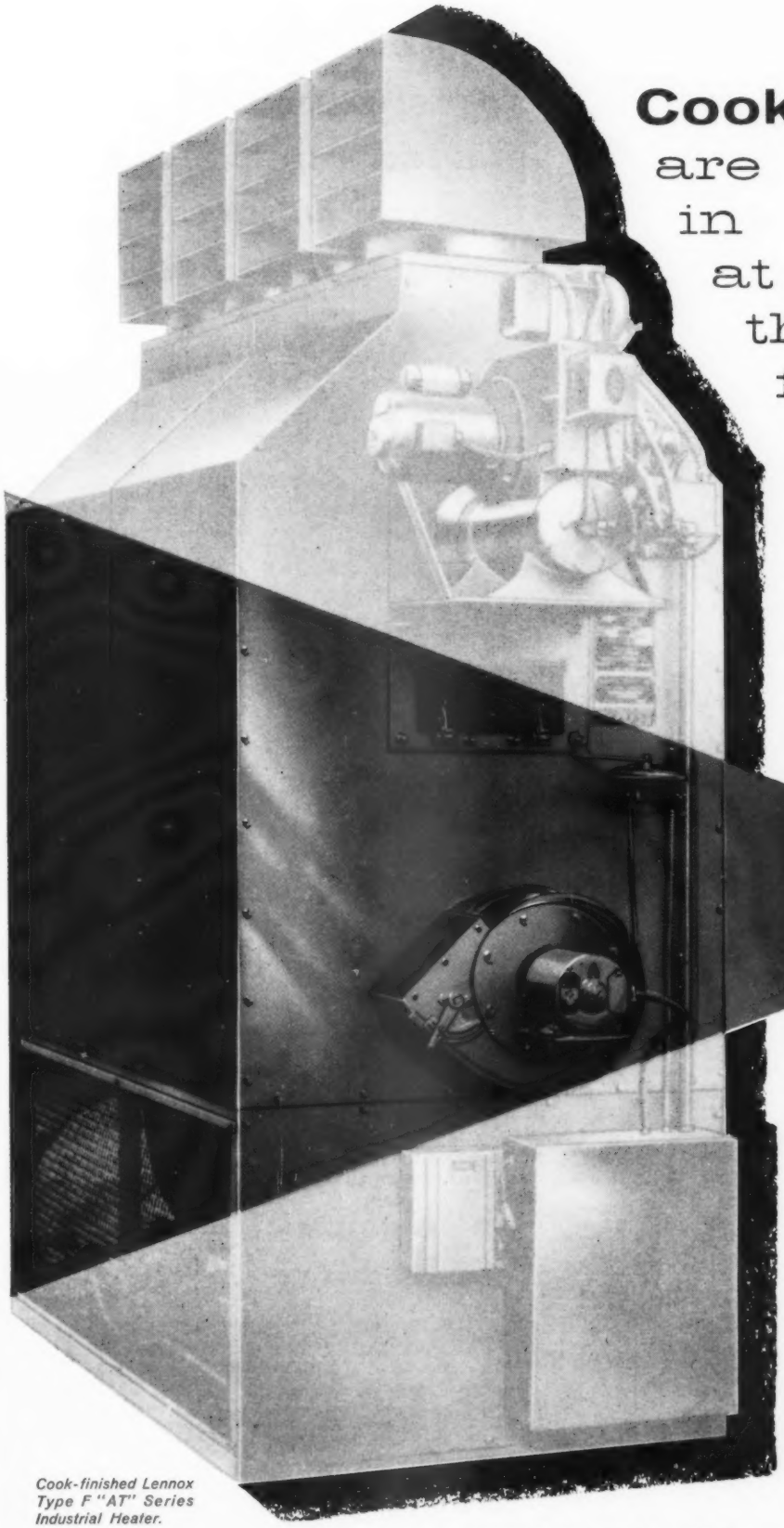
Federal's plant will be available for the increased production of Berkeley-Davis machines, and Federal's nationwide district representatives will provide a sales organization for Berkeley-Davis products.

United Wallpaper Facility Nears Completion

Construction work on the new synthetic resin plant of the Steen Resin and Chemical Co., a division of United Wallpaper, Inc., is more than half completed. This plant is the most recent addition to the facilities of United, one of the country's largest producers of resins, chemicals, and coatings for industrial and commercial applications. Ground breaking for the new structure, which is located in Chicago Heights, Ill., a suburb 25 miles south of Chicago, took place last June. The plant will be completed early in the summer of this year.

Located on a 20-acre site, the plant will include 50,000 square feet of area devoted to the manufacture and storage of synthetic resins, and 12,000 square feet of office and laboratory space. In addition, an outdoor tank farm with a capacity of 96,000 gallons is being constructed on the site.

Aerial view showing (1) storage tank pads, (2) underground tank area, (3) process building, (4) boiler house, (5) warehouse, (6) laboratories, and (7) offices.



Cook's Paints are in at the finish with LENNOX

Look at a Lennox Industrial Heater and you get an instant impression of quality. The fine finish not only speaks for itself, but also for the quality of materials and workmanship beneath it.

Lennox knows that finish is an important part of product personality... that eye appeal helps sell products. That's why they use a Cook's specialized industrial finish—in this case Cook's beautiful, durable gray-green hammered effect enamel.

That's also why Cook's industrial finishes are so widely used on thousands of products from Automobiles to Zippers. Manufacturers in every field call on Cook's for finishes that combine beauty, protection and ease of use on the production line. And Cook's invariably delivers.

COOK'S PAINTS

Cook-finished Lennox Type F "AT" Series Industrial Heater.

Cook Paint & Varnish Company • Kansas City, Missouri

Factories: Kansas City • Detroit • Houston

How one precise adjustment started a new era in stamped metal production

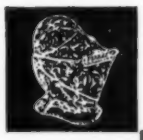
It was back in 1954. A group of Wean Equipment Corporation executives and engineers were gathered around a bench-size prototype of an idea; an idea for a new kind of stamping press so revolutionary that it was decided to build a scale model embodying the principle before any development work was done on full-size equipment.

The group watched the Wean research director who had conceived and built the model make a careful final check; involuntarily held its breath while the switch was thrown. Nothing happened. In the short silence that followed no one moved . . . until, with a muttered comment, the research director directed one sharp blow at the side frame of the model with a lead hammer lying nearby.

The resulting clatter of the press, galvanized into action by this unexpected persuasion, heralded a new era in metalworking. For the "Flying Press" principle was first proved practical in that bench model; has been proved time and again in production size presses of from 20 to 300 ton capacity installed in forward-looking stamping plants.

We say "new era" because the "Flying Press" permits metal to be stamped and formed from coil without stationary indexing of the strip as it passes through the press. This continuous, uniform motion of metal through the "Flying Press" results in higher parts production from the same dies used in ordinary presses. But perhaps more importantly for the future, the "Flying Press" principle is unique, in that it matches press operation to the continuous-flow production techniques necessary for automated operations.

If you use stamping presses, you should know about this unique development that permits speeds never before possible while offering tooling protection, reduced die maintenance, and vastly reduced press maintenance requirements. There are too many other advantages of the Wean "Flying Press" to discuss here, but we've summarized them in a brochure. We'll be glad to send you this literature on request.



WEAN

WEAN EQUIPMENT CORPORATION

CLEVELAND 17, OHIO

Detroit • Chicago • Newark

MACCO MACHINE CLEANER 71-D prevents RUST SPREAD & BLISTERS

a phosphate cleaner and rust inhibitor

LEADING METAL PROCESSORS

Indorse its Use for . . .

- **CAMERAS**
- **TV CABINETS**
- **APPLIANCES**
- **TAPE RECORDERS**
- **LAWN FURNITURE**
- **MOLDING**
- **TOYS, etc.**

MACCO 71-D is by far the most efficient and economical method of preparing metals for the finest and longest lasting paint job. Laboratory and shop tests prove that, on steel, cast iron, aluminum or die cast, MACCO 71-D provides a corrosion-resistant phosphate coating comparable in quality to that formerly available only through expensive and involved methods of preparation.

MACCO M. C. No. 71-D CLEANER

• 1. Cleans metals and etches in one operation. • 2. Is more economical because of solution's longer life. • 3. Gives microscopic phosphate coating, greatly aiding in paint adhesion and corrosion resistance. • 4. Requires no special equipment. • 5.Never hardens in the drum. • 6. Gives excellent protection against rust prior to painting. • 7. Makes it simple to control solution. • 8. Can be run in conventional one, two, or three stage washers, and in other types.

MACCO PRODUCTS COMPANY

Manufacturers of Better Metal-Working Compounds since 1931

9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS • PRESCOT 9-0800

SUPPLIER PERSONALS

Edward B. Reynolds has joined Olin Mathieson Chemical Corp. as New York regional sales manager for Olin Aluminum.

Edward F. Brautigam has been appointed Eastern manager, and **John W. Brightman,** chief product engineer of The Nylok Corp., Paramus, N. J.

Donald G. Dutcher has joined Hanson-Van Winkle-Munning Co., manufacturers of electroplating equipment, as chief electrical engineer, the company announced.

Dutcher's appointment was announced as part of the firm's plan to expand its research and development programs. The company is building new mechanical and electrical laboratory facilities and expanding facilities of its electrochemical laboratory.

The changes particularly affect the plating, anodizing, and allied processing fields, especially those involving conveyor automation controls and DC current equipment, the report states.

The R. D. Werner Co., Inc., manufacturers of Chromtrim metal mouldings, aluminum ladders and staging and Ardee frames announced the recent appointment of **Philip G. Fellinger** as product manager of the company.

DUTCHER

FELLINGER

Appointments are announced of key manufacturing and sales personnel in the recently-formed Girdler Process Equipment Division of National Cylinder Gas Co., Chicago.

John E. Slaughter, Jr., division president, said **Bruce D. Miller** has been named vice president of manufacturing; **Allen M. Bond, Jr.,** director of engineering and product development, and **N. T. Joyner,** general sales manager.

Slaughter said the assignments are part of a realignment of the company under which the division becomes one of seven operating units.

Appointment of two field salesmen for the Stainless Steel Division of Jones & Laughlin Steel Corp. has been announced by John H. Abbott, vice president - sales for the division.

Cornel Bolog, 277 South Wolf Street, Des Plaines, Ill., has been named a salesman in the Division's Chicago District office, Avenue State Bank Building, 104 North Oak Park Avenue, Oak Park, Ill.

Joseph M. Weaver, 10743 West Eleven Mile Road, Huntington Woods, Mich., has been appointed a salesman in the Division's Detroit District. He will be headquartered in the Division's main office, 21000 Mound Road, Detroit 34.

Recently appointed by American Buff Co., Chicago manufacturer of buffs for the finishing industry, **Tom Wiggins** will serve as Southeastern Michigan sales engineer. His headquarters in Detroit will be only a short move from previous locations in Michigan.

SAD SOAK TANK TALE
...WITH A HAPPY ENDING
BILL*, I'VE CALLED YOU IN BECAUSE I'VE GOT TO CUT CLEANING COSTS ON THE ALUMINUM SHEETS, CASTINGS AND EXTRUSIONS WE PREPARE FOR ANODIZING.
OK BY ME, KEN. PUTTING THE AXE TO A CUSTOMER'S COSTS IS A PENNSALT SPECIALTY. WHAT'S YOUR PROBLEM?
NOT WHEN YOU USE PENNSALT A-28. IT'S AN ANHYDROUS POWDERED ALKALINE CLEANER THAT'S SPECIALLY INHIBITED TO PREVENT ATTACK ON ALUMINUM. AND A-28 DOES A GREAT JOB OF REMOVING RED AND BLACK MARKING INKS, FINGER MARKS AND SHOP SOILS.
LATER THE SAME WEEK
I WOULDN'T BELIEVE IT IF I HADN'T SEEN IT WITH MY OWN EYES. WE'VE COMPLETELY ELIMINATED HAND WIPING. EVERYBODY HERE IS PLEASED AS PUNCH WITH THE RESULTS.

Increased emphasis on the engineering aspect of sales to original equipment manufacturers was announced recently by Controls Company of America with the appointment of longtime company engineers to newly-established positions as managers of major product classifications.

Louis Putze, president, named **Robert W. Sloane** as product manager for oil controls sales, **D. C. Albright** as product manager for refrigeration controls sales, and **L. C. Thompson** as product manager for gas controls sales. All will be headquartered in the company's Milwaukee A-P controls operation and report to Albert L. Topp, vice president in charge of both A-P engineering and sales to original equipment manufacturers.

Appointment of **J. E. Massey** as chief engineer of Delta Tank Mfg. Co., Inc., with headquarters in Baton Rouge, was announced recently by Hal S. Phillips, president.

At the same time, Phillips announced that **John S. Perry** has joined Delta Tank and will assume Massey's former duties as district sales manager in the Houston, Texas branch office.

E. W. McCaul, vice president of sales, Jervis B. Webb Co., has announced the addition of **Carl M. Kaltwasser** to the staff of field engineers in Pittsburgh, to serve in the West Virginia and Western Pennsylvania area. He will assist Gilbert K. Phares, district manager, on area projects pertaining to mechanized handling of materials.

MASSEY

KALTWASSER

Federal Pacific Electric Co. has appointed **Frank S. Nelson** manager of its Scranton plant, and **Bernard G. Tremblay** assistant plant manager at its Newark, N. J., manufacturing operation, according to an announcement by T. M. Cole, executive vice president.

Gordon C. Curry has been appointed general sales manager of Dollin Corp., Irvington, N. J., manufacturers of zinc and aluminum die-castings.

PMI technical meeting

→ *from Page 50*

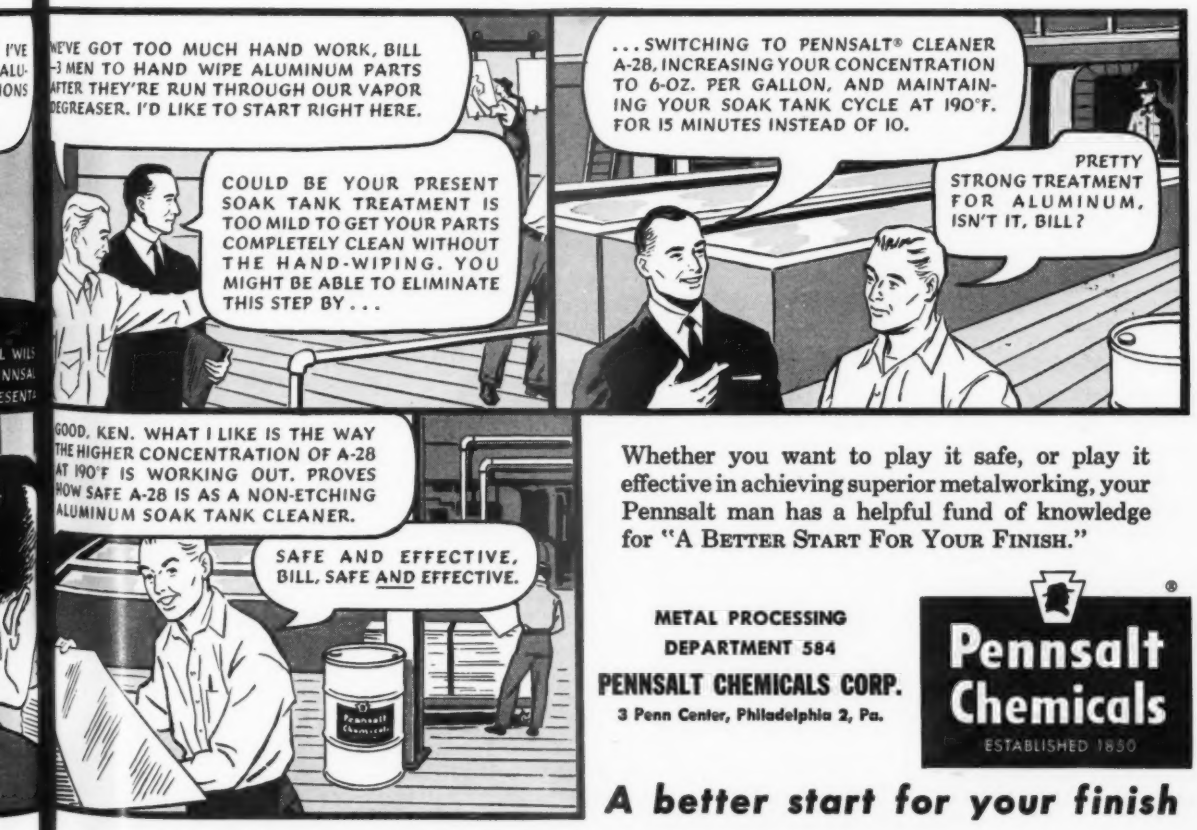
cannot afford a safety engineer because such people are available as consultants and can usually solve safety problems very quickly. An excellent film was presented on how to construct safety guards on presses by the Industrial Accident Prevention Assn. of Toronto, Ontario, Canada. Proof that a few dollars spent on providing safety guards is worth it was graphically shown.

Plant visits

On the morning of the third day visits were made to Advance Stamping Co. and Detroit Stamping Company in Detroit. Chartered buses were provided and the group returned to the hotel for a luncheon which was highlighted by a talk by F. R. Widmer, Republic Steel, entitled "Planning for Tomorrow's Opportunities."

Problem solving clinic

Stanley R. Cope, president of the Acme School of Die Design Engineering, South Bend, Indiana, conducted a panel discussion on problem solving, in the final session. It was the consensus of opinion after this session that practically every problem that ever comes up can be solved. A complete summary of the proceedings will be sent to all those who attended.

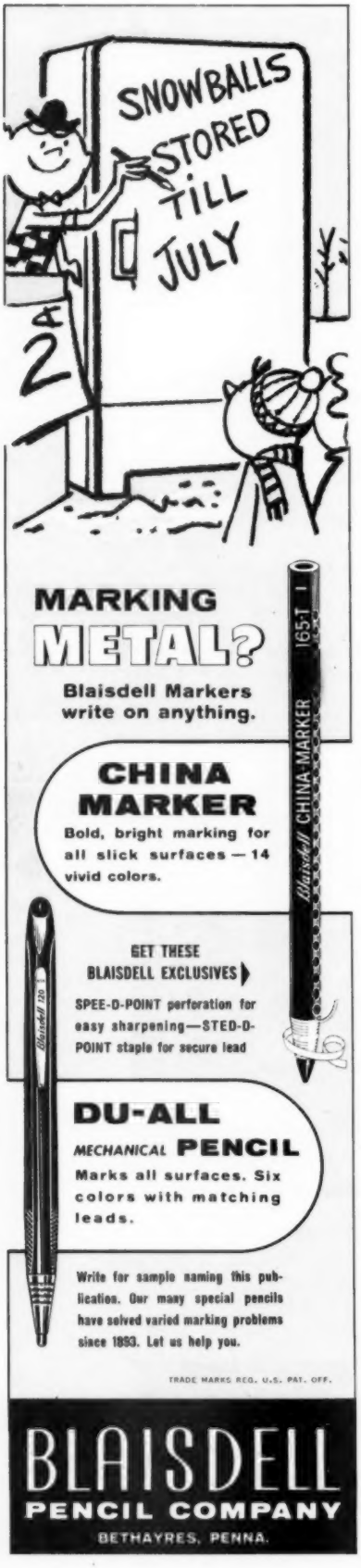

WE'VE GOT TOO MUCH HAND WORK, BILL —3 MEN TO HAND WIPE ALUMINUM PARTS AFTER THEY'RE RUN THROUGH OUR VAPOR DEGREASER. I'D LIKE TO START RIGHT HERE.
COULD BE YOUR PRESENT SOAK TANK TREATMENT IS TOO MILD TO GET YOUR PARTS COMPLETELY CLEAN WITHOUT THE HAND-WIPING. YOU MIGHT BE ABLE TO ELIMINATE THIS STEP BY . . .
. . . SWITCHING TO PENNSALT® CLEANER A-28, INCREASING YOUR CONCENTRATION TO 6-OZ. PER GALLON, AND MAINTAINING YOUR SOAK TANK CYCLE AT 190°F. FOR 15 MINUTES INSTEAD OF 10.
PRETTY STRONG TREATMENT FOR ALUMINUM, ISN'T IT, BILL?
GOOD, KEN. WHAT I LIKE IS THE WAY THE HIGHER CONCENTRATION OF A-28 AT 190°F IS WORKING OUT. PROVES HOW SAFE A-28 IS AS A NON-ETCHING ALUMINUM SOAK TANK CLEANER.
SAFE AND EFFECTIVE, BILL, SAFE AND EFFECTIVE.

Whether you want to play it safe, or play it effective in achieving superior metalworking, your Pennsalt man has a helpful fund of knowledge for "A Better Start For Your Finish."

METAL PROCESSING
DEPARTMENT 584
PENNSALT CHEMICALS CORP.
3 Penn Center, Philadelphia 2, Pa.

Pennsalt Chemicals
ESTABLISHED 1850

A better start for your finish


SNOWBALLS STORED TILL JULY
MARKING METAL?
Blaisdell Markers write on anything.
CHINA MARKER
Bold, bright marking for all slick surfaces — 14 vivid colors.
GET THESE BLAISDELL EXCLUSIVES
SPEE-D-POINT perforation for easy sharpening—STED-D-POINT staple for secure lead
DU-ALL MECHANICAL PENCIL
Marks all surfaces. Six colors with matching leads.
Write for sample naming this publication. Our many special pencils have solved varied marking problems since 1893. Let us help you.
TRADE MARKS REG. U.S. PAT. OFF.
BLAISDELL
PENCIL COMPANY
BETHAYRES, PENNA.

METAL PRODUCTS STATISTICS

a current report on available production, shipment and sales figures for important products in the appliance and fabricated metal products manufacturing field

GAS WATER HEATERS — January shipments 238,200, 10.8 per cent over '57.

GAS RANGES, BUILT-IN — January shipments 12,900, 3.7 per cent below '57.

GAS RANGES, FREE STANDING — January shipments 117,000, 14.1 per cent below '57.

GAS FURNACES — January shipments 48,800, 2.3 per cent over '57.

GAS-FIRED BOILERS — January shipments 5,100, 1.9 per cent below '57.

GAS CONVERSION BURNERS — January shipments 7,300, 0 per cent over '57.

ELECTRIC REFRIGERATORS — December shipments 214,600, 17 per cent below '56; January-December 3,350,000, 10 per cent below '56.

ELECTRIC FREEZERS — December shipments 47,400, 18 per cent below '56; January-December 965,000, 10 per cent below '56.

ELECTRIC RANGES, BUILT-IN — December shipments 36,800, 22 per cent over '56; January-December 425,000, 10 per cent over '56.

ELECTRIC RANGES, FREE STANDING — December shipments 77,000, 20 per cent below '56; January-December 980,000, 18 per cent below '56.

ELECTRIC WATER HEATERS — December shipments 60,500, 0 per cent below '56; January-December 800,000, 8 per cent below '56.

ELECTRIC DISHWASHERS — December shipments 29,900, 5 per cent below '56; January-December 390,000, 3 per cent below '56.

ELECTRIC FOOD WASTE DISPOSERS — December shipments, 55,300, 26 per cent over '56; January-December 550,000, 7 per cent below '56.

COMBINATION WASHER-DRYER — January factory sales 13,339, 28 per cent below '57.

WASHERS, AUTOMATIC & SEMI-AUTOMATIC — January factory sales 185,147, 29 per cent below '57.

WASHERS, WRINGER & ALL OTHER — January factory sales 53,006, 24 per cent below '57.

*ELECTRIC DRYERS** — January factory sales 68,387, 37 per cent below '57.

*GAS DRYERS** — January factory sales 30,243, 18 per cent below '57.

IRONERS — January factory sales, 2,374, 46 per cent below '57.

VACUUM CLEANERS — January factory sales 265,489, 4.6 per cent below '57.

METAL FURNITURE — January shipments 1.0 per cent below '57.

TELEVISION — December shipments 923,339, 4 per cent below '56; January-December 6,560,220, 4 per cent below '56.

*RADIO*** — December shipments, 2,031,444, 25 per cent over '56; January-December 9,721,285, 20 per cent over '56.

COMPRESSOR BODIES (Including Autombile Units) — Shipments for November, 202,323, 28 per cent below '56; January-November 3,739,686, to per cent below '56.

STEEL SHIPPING BARRELS & DRUMS — November shipments 2,531,695, 16 per cent below '56; January-November, 32,424,702, 9 per cent below '56.

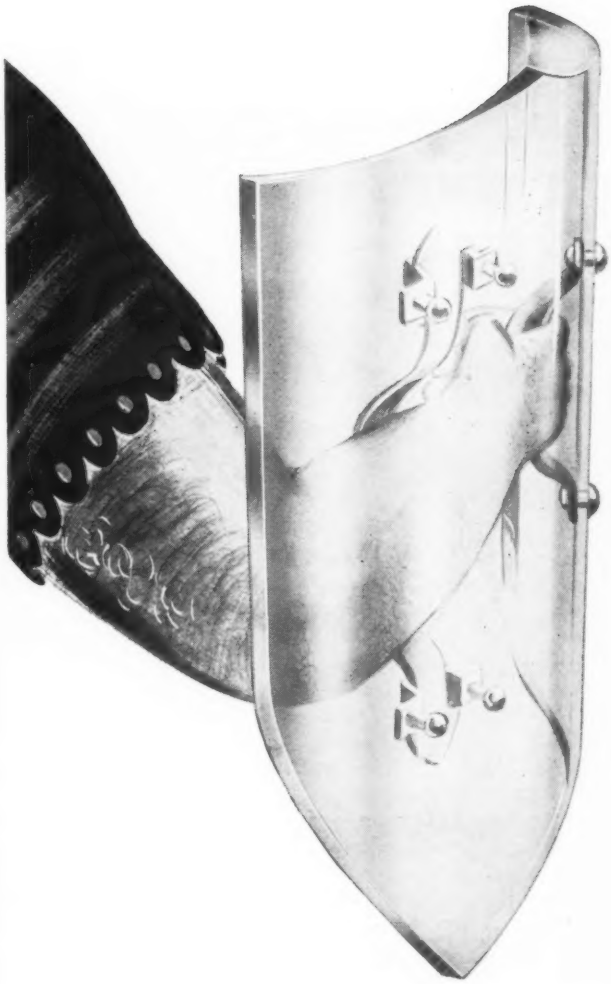
STEEL PAILS — November shipments 4,943,507, 25 per cent below '56; January-November 69,235,275, 12 per cent below '56.

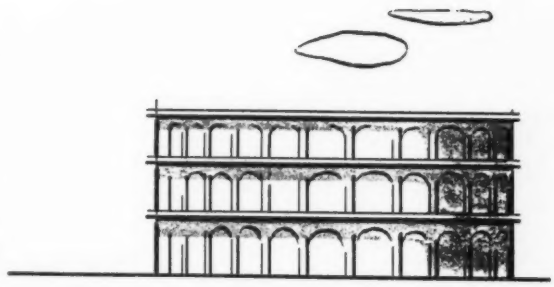
TYPEWRITERS — December factory shipments 126,853; January-December, 1,645,266.

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, and Air-Conditioning and Refrigeration Institute, U.S. Dept. of Commerce.

*Note: The above 1957 data have been adjusted to reflect combination washer-dryer sales separately. Combination sales are not counted as either an automatic washer or an automatic dryer. For 1957, breakdown of gas and electric dryer data from which gas and electric combination data have been subtracted, cannot be released without disclosing individual company information.

**Does not include automobile radios.





this *Glass* shield,

while symbolic,

represents some of the things a master craftsman can do with glass. It can be bowed to fit any desired shape, it can be drilled and shaped to exact tolerances.

It can be tempered to impart extreme resistance to impact — that is why safety regulations demand glass as a safety barrier when danger exists.

Let glass improve the utility of your product while it beautifies it.

Let Marsco's craftsmen-engineering team impart to your product all the advantages of glass

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT

Special shapes for: Instruments, Gauges, Household and Industrial Appliances.

Marsco

MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.

NEW INDUSTRIAL LITERATURE

Container Catalog

This free catalog describes a complete line of containers for all shipping purposes offered by this manufacturer. This is a well illustrated catalog which describes: cleated boxes, pallet boxes, wirebound crates and boxes, corrugated and hinged corner crates and boxes. Write Dept. MPM, Chicago Mill and Lumber Co., 33 S. Clark St., Chicago 3, Ill.

Booklet on Nickel-Chromium Alloy

This booklet entitled "Keep Operating Costs Down . . . When Temperatures Go Up" is free and is a useful booklet to have. It explains how this material can be used for drop rods, burning tools and furnace parts. Write Dept. MPM, The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.

Free New Bulletin and Solenoid Selector

A complete booklet describing the many applications of solenoids is available, along with a solenoid selector that quickly and easily matches a solenoid to a specific application. Applications include valve actuation, clutch operation, switch function, metering devices, shutter and damper control, and many other operations. For the free bulletin and solenoid selector, contact Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

Illustrated Booklet on Metal Cleaning

This is a 44-page illustrated booklet called "Some good things to know about metal cleaning." It covers such subjects as: tank cleeaning methods, machine cleaning methods, ultrasonic cleaning, pickling, deoxidizing, bright dipping, applying zinc phosphate coatings, etc. Write Dept MPM, Oakite Products, Inc., 17 Rector St., New York 6, N. Y.

Thermo-Setting Acrylic Enamel

This new brochure contains information about Duracron a thermo-setting acrylic enamel. It is claimed that this new material has superior adhesion, color and gloss retention, durability, flexibility and resistance to chemicals, grease, humidity, moisture, salt spray, stains and impact for a wide variety of end uses. Write Dept. MPM, Pittsburgh Plate Glass Co., Industrial Finishes Div., 1 Gateway Center, Pittsburgh, Pa.

Brochure on High Production Press

If your manufacturing operation calls for the fabrication of metal parts at as high a production rate as possible you should be interested in reading this brochure on the "Flying Press." Write Dept MPM, Wean Equipment Corp., 22828 Lakeland Blvd., Cleveland 17, Ohio.

Electrolytic Zinc-Coated Steel

This free brochure describes the qualities of this company's electrolytic zinc-coated steel for both outdoor and indoor use. For complete information on Weirzin, Weirton Steel Co., Dept. R-15, Weirton, W. Va.

Fastener Booklet

Just published, a 40-page catalog for the purchaser of standard fasteners. The catalog lists, with quantities available, the thousands of fasteners carried in stock.

In addition, it illustrates and describes the firm's manufacturing divisions: stamping, cold-heading, and screw machine.

For free copy of this book, write Dept. MPM, Abbott Screw & Bolt Co., 1728 W. Walnut St., Chicago 12, Ill.

Plan Book of Metal Mouldings

Rings for washers, bezels for television, dinette trim and aprons, refrigerator kick plates and escutcheons, stove back guard trim, sink rims, medicine cabinet frames, wallboard mouldings are some of the applications for stainless steel or other metal mouldings. Facilities for rolling, bending, stamping and buffing are described in this book whose title is the head of this item. Write Dept. MPM, Pyramid Mouldings, Inc., 5365 W. Armstrong Ave., Chicago 30, Ill.

Insulated Metal Curtain Walls and Fire Walls

A completely illustrated catalog is available on insulated metal curtain walls and Underwriters' rated fire walls. Materials in a wide variety are available both in the metal used and the insulating or fire proofing back-up material used. Aluminum, stainless steel, galvanized steel, or painted steel are the metals available. The back-up materials available are: glass fiber, gypsum board, and other materials. Standard section lengths and sizes are available to satisfy nearly every construction requirement. All necessary construction details are included in the booklet. For the booklet write the R. C. Mahon Co., Detroit 34, Michigan.

Corrugating Sheets With Roll Forming Machine

It is now said to be possible to corrugate 20 through 28 gauge galvanized steel, aluminized steel, plain and embossed aluminum. A new roll forming machine available requires only vertical adjustment for gauge range. Roller die tooling is available for ½″ or ⅞″ depth. The operating speed of the machine is 150′ per minute, and it is claimed that an excellent control of coverage and depth is possible. For complete information, contact Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

Resistance Welding Bulletin

A new 12-page bulletin fully describes several resistance welding case histories which point out the production advantages and product quality obtained through these welding techniques. For a copy of "Resistance Welding at Work," Volume 5, No. 2, write to Dept. MPM, Sciaky Brothers Inc., 4915 W. 67th St., Chicago, Ill.

Booklet on Porcelain Enameling Iron

A new booklet is available which gives the complete story on porcelain enameling, and how it can offer new opportunity in the design of new appliances. Everything is included from analysis and application to latest methods of application, according to the manufacturer. Data on important material characteristics of enameling iron, and qualities it can provide as a base metal for porcelain enamel finishes, is included. For your free copy, contact Dept. MPM, Armco Steel Corp., 118 Curtis St., Middletown, Ohio.

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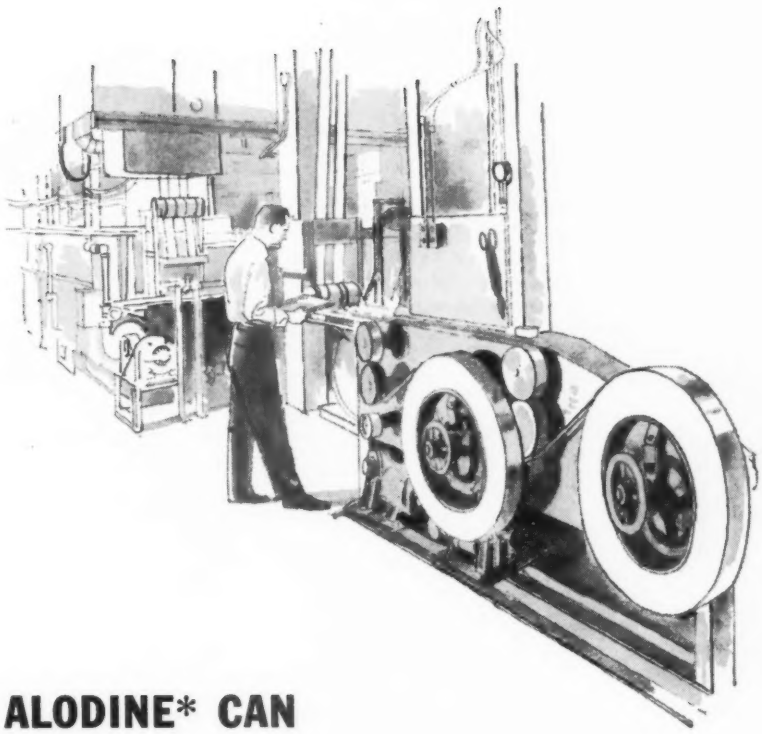

ACP ALODINE* CAN

CUT COSTS FOR YOU

An aluminum awning manufacturer *cut operating costs* 66%, increased output 50% by treating strip with ACP ALODINE. This process permits roll forming after enameling without marring the finish, too. The former way was slow and inefficient, machine downtime was excessive, the finish was too brittle to roll form.

ACP ALODINE can improve your operation and *cut costs* for you. Write today for complete information about ACP ALODINE and its functions in protecting aluminum and bonding paint to it.

*ALODINE is a registered trademark of American Chemical Paint Company

CHEMICALS ACP PROCESSES

AMERICAN CHEMICAL PAINT COMPANY

Ambler 33, Pa.

Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont.

Porcelain enamels

→ *from Page 63*

1100 and 3003, while others require extensive metal preparation. Successful metal treatments for some alloys have not been accomplished, and these alloys are at present avoided in production work.

Alloy 6061 is one of the better alloys for enameling, because it can take two or more firings without hairlining; whereas 1100 and 3003 often hairline when second or third coats are applied in successive firing treatments.

Alloy 6061 is more apt to produce metal reactions than 1100 and 3003 when improperly-buffered milled enamels are applied. Alloy 6061 has high mechanical strength and greatly surpasses 1100 and 3003 in this respect. The most serious disadvantage attributed to 6061 is the defect known as "water spalling," which often takes place when fired enamel coats are subjected to wet or humid conditions. This can be overcome in most cases by forming an insoluble and inert film or coating on the 6061 alloy surface before enameling. Many treatments have been suggested, and a number developed for coating and rendering passive the surface of alloy 6061. American Chemical Paint, Northwest Chemical, and Parker Rust Proof all have developed treatments for alloy 6061, and there may be others unknown to the writer. As an example of a typical treatment employed, American Chemical Paint suggests the following:

1. Ridoline 53, Alkaline clean — 5 minutes.
2. Water rinse.
3. Alcoa R-100, 160° F., 1 minute.
4. Water rinse.
5. Alodine 1200, 1 oz./gal., 1 minute, room temperature.
6. Water rinse and air dry.

Alodine 100 — 5 minutes, or Alodine 600 — 2 minutes, may be substituted in stage five. We have found Alodine 600 to be very satisfactory in our laboratory evaluation.

Clad metals may help

The use of Alclad alloys would solve many problems in metal treatment. Alloy 6061 with clad surfaces of 1100 or 3003 requires a minimum of metal treatment, and still possesses the desirable properties of high mechanical strength and the ability to withstand repeated firings. Some commercial tests have been made with this material, but apparently more work remains to be done, both by the flat-rolled aluminum producer and the enameler, to overcome certain difficulties. Only flat-rolled products could be made this way — extrusions of 6061, 6062, or 6063 and castings would still require special metal preparation.

Treatments for aluminized steel vary. Simple alkaline cleaning or pre-firing rapidly at low temperatures can be used for most applications.

Greater uniformity at 1000° F., or lower, is possible in new firing equipment. Enamel formulations with broader firing ranges are being studied, but we can't escape the fact that the physical properties of porcelain enamels for aluminum, like steel enamels, glass enamels, and glazes are dependent upon time-temperature relations. Large variations in temperature and/or time affect such properties as gloss, color, chemical stability, etc.

Drying problems have not been completely solved, although the difficulties encountered with tearing and metal reactions have largely disappeared. Ware can be dried before firing, if so desired, but cannot be held at room temperature for long periods in the dried-coating

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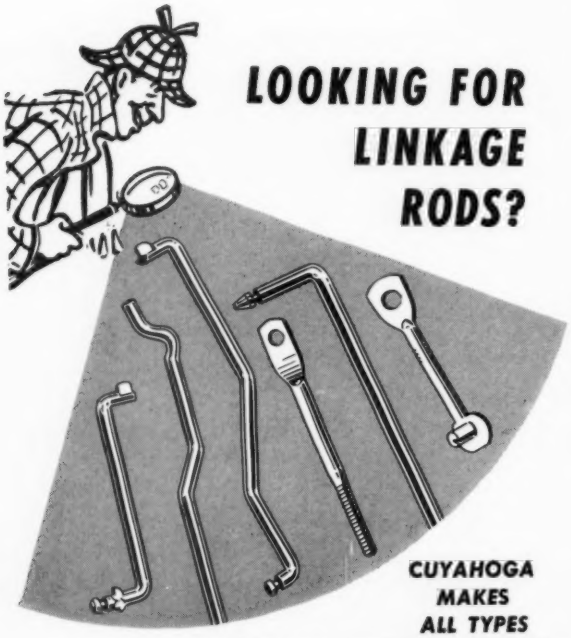

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Important News FROM MEYERCORD

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The modern, low cost solution to plant equipment identification . . . now in use by leading manufacturers and service organizations. Provides standardized identification, absolute legibility, and permanency at remarkably low cost. Kit includes 474 signs assorted over 59 operational subjects. Easily applied in seconds. Check for literature.

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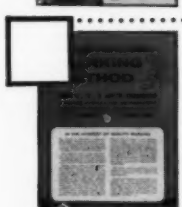
Take the Guesswork Out of Your Lubrication

An important preventive maintenance program. The *Lubri-Cal Marking Kit* consists of the proper frequency of numerals, letters and instruction nameplates for identifying lubrication points and required lubricants on plant, production and operating equipment. *Lubri-Cals* are permanent, tough, oil-resistant transfers; easily adaptable to any lubrication system.



MEYERCORD DECAL MARKING METHOD

Decal product markings for "difficult surfaces"

Heat, abrasion, weather and many of the new industrial surfaces are deadly enemies of most product markings. But not to new, improved Meyercord Decal Markings—types C, G, J and H (heat resistant). One of these new markings will almost certainly solve the problem. For exact recommendations. Ask for new brochure.

the MEYERCORD co.

Dept. T-121, 5323 West Lake St., Chicago 44, Illinois

safe transit

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York Street at Park Avenue
Elmhurst, Illinois

editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

Meeting For Study of Export Shipment Damage

The National Safe Transit Committee acted as sponsor, and coordinated a meeting for the study of export shipment damage on February 26, 1958 at the Mayflower Hotel, Washington, D.C.

In recent months the National Safe Transit Committee had been approached by several executives from the major household appliance industry regarding excessive export shipment damage, and they stressed the need for cooperative effort to reduce these losses. These individuals reported that damage to major appliances being shipped to certain areas of the world continue to soar to alarming proportions. At the request of these industry representatives, the National Safe Transit Committee agreed to sponsor a meeting of representatives from the major companies concerned to study the feasibility of a damage reduction program in the export field.

Meeting as an industry group, it was agreed that damages to export shipments of major appliances not only placed an unnecessary burden on American manufacturers, but also posed a serious threat to the entire major appliance export industry.

At the meeting, the National Safe Transit Committee was requested to coordinate a cooperative major household appliance industry program aimed at reduction of damage to export shipments — to be known as the Committee on Export Shipment Damage.

Committees will consist of one representative from each of the interested major appliance companies. Committee chairmen will be selected by the National Safe Transit Committee.

John C. Oliver, secretary, National Safe Transit Committee, made the introductory comments, establishing NST's willingness to cooperate as requested, and sketching the problem for discussion.

From this point Ralph F. Bisbee, general chairman of the NST Committee, assumed the duties of the chair, presiding for the remainder of the day.

The following representatives from industry were present:

W. J. Anderson	Westinghouse Electric Corp.
J. G. Crowell	Philco Corp.
C. M. Farner	Int'l General Electric Co.
K. P. Groat	York Division, Borg-Warner Corp.
P. W. Longstreet	Westinghouse Electric Int'l Co.
Martin Mak	Whirlpool Corp., Int'l Div.
W. V. McKenzie	Borg-Warner Int'l
J. R. Rinehart	Westinghouse Electric Int'l Co.
Charles Schlehner	Int'l General Electric Co.
L. W. Schmucker	The O. A. Sutton Corp.
P. O. Vogt	General Electric Co.

SIPMHE to Sponsor Exposition In Chicago October 14-16

The annual exposition, competition and short course sponsored by the Society of Industrial Packaging and Materials Handling Engineers (SIPMHE) has been returned to the direction of SIPMHE itself and will be held in Chicago next October 14-16. This will be the thirteenth such presentation.

John Mount of the Insurance Company of North America, Philadelphia, national president of SIPMHE, announced the move. The annual triple feature event, which was held last October in Atlantic City under other direction, will once again be 100 percent SIPMHE conducted, Mount said.

The exposition, to be known as the National Industrial Packaging, Handling and Shipping Exposition, will be held three days instead of the previous four. The dates are October 14, 15 and 16. The site is the Coliseum in Chicago. General chairman of the exposition is Paul F. Schreck of Cleveland, vice president of Moto-True Inc.

The annual short course will open on Monday, October 13, one day ahead of the exposition itself, under the sponsorship of the University of Illinois, Extension Division, Department of Mechanical Engineering. Sessions will be divided between the Coliseum and the Morrison Hotel.

The National Packaging and Handling Competition will again be held with winners being announced at special ceremonies. N. F. Behme, Jr., of the National Classification Board of the Motor Carrier Industry, Washington, D.C., is chairman of the competition.

John M. Nelson, III, vice president of the Nelson Co., Baltimore, Md., was elected president of the National Wooden Box Association at its 59th annual meeting held February 7 and 8 at Boca Raton, Florida.

How the vendor packaging program saved Whirlpool $50,000 in the first year

by Joseph W. Mueller • PACKAGING ENGINEER, WHIRLPOOL-SEEGER CORP.

unitized pallet pack cuts labor costs, space, and time in loading and unloading components

MPM EXCLUSIVE FEATURE

The "Vendor Packaging Program" was started the latter part of 1955. A separate department was organized reporting to the Chief Industrial Engineer. This department was independent of the Product Packaging Section of the St. Joseph Division.

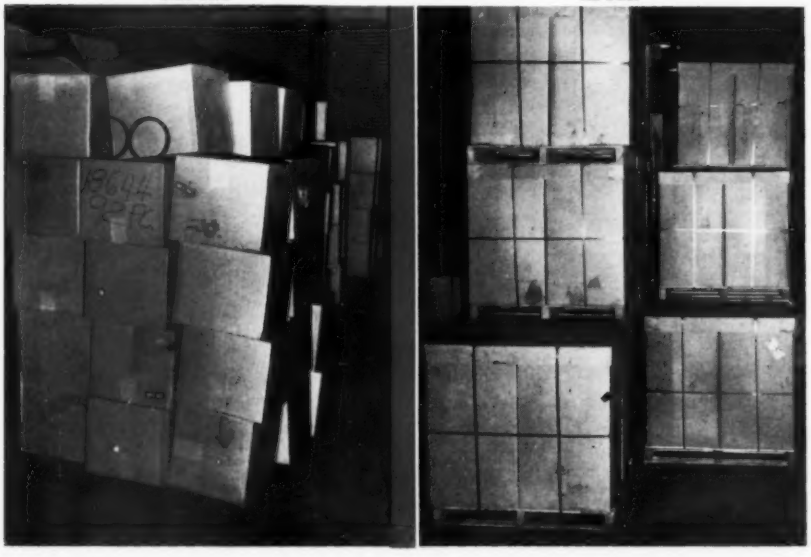
The Industrial Engineering Department realized the great potential savings by more efficient handling methods of material in and out of our warehouses and throughout the plant. We realize:

1. The unitized pallet pack cuts labor costs to a minimum.
2. More material is moved faster by fewer men.
3. No costly hand moving of numerous individual cartons.
4. Loading, unloading and warehouse movements are cut to a minimum.
5. More efficient stacking methods are made possible.
6. More material is stored in less space.

The introduction of the pallet program, to the vendors, was handled through the Purchasing Department. As pallet designs were developed, Purchasing notified our vendors to contact our department. The first reaction by many of the vendors was not favorable. However, after continued explanations, showing samples and specifications, many of them readjusted their thinking and could see mutual benefits.

This view shows timers in "before and after" (l-r) packaging. Space savings in this item are 35 per cent. Big advantage in new packing method is flexibility — if the pallet contents are only partially used, it is still intact.

BEFORE AFTER



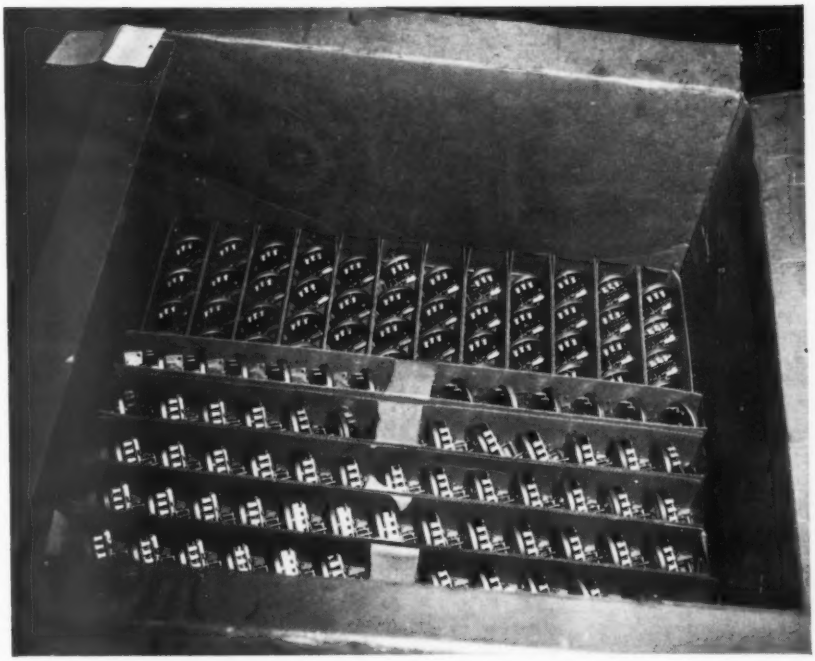
The author has been with Whirlpool Corp. for 18 years. The last eight years have been spent in packaging. Prior to that, he was engaged in product design work. He worked as assistant packaging engineer until 1955 when he was placed in charge of the vendor packaging program. In 1957, Mueller was made packaging engineer. His formal packaging education consisted of seminars at Michigan State university and Rossford ordnance school.

One of the first vendors approached on our program was Soreng Division of Controls Company of America. Soreng is now one of our larger suppliers using the palletized method for shipment. They are very satisfied with the change from cartons to palletized shipments wherever possible.

The standard pack size we decided to use in our palletizing program is 41″ X 41″. The trays are 40″ long and vary in width and depth with the part placed in the tray. The container is made in two pieces. The lower section is a half-slotted container. The upper section is a taped tube that fits around the half-slotted carton. The order of packing is as follows:

1. A cap is set on the pallet.
2. The half-slotted carton is set in the cap.
3. The half-slotted carton is then filled with trays, each layer 90° to the previous layer to achieve stacking strength.
4. The outside tube is then placed over the half-slotted carton down into the cap.

Tray-type pack of pressure switches. The trays are 40" long and vary in width and depth with the part placed in the tray. Each succeeding layer of trays is turned 90° in a crisscross method.



5. The pallet is then completely filled with trays.
6. A cap is then placed over the complete pack and the complete unit strapped to the pallet.

The 41" sq. pallet was decided on for several reasons:

1. Two wide in a truck with a minimum of space left on sides.
2. The square pallet is necessary for the tray type interior pack to achieve the crisscross packing method.

The carton design was decided on for the following reasons:

1. Ease of packing and unpacking. Some tubes are 38" in height. Trying to reach the bottom is almost impossible. This type pack permits the packing in sections. The un-packing is done in the same manner.
2. The double wall protection is in the lower part of the pack where it is most needed.
3. Flexibility — If the pallet contents are only partially used, it is still intact. The outer tube is removed and the top cap placed over the half-slotted carton.

The tray design, holding the parts, was designed for the following reasons:

1. Economy.
2. Handling — Picking up more than one piece at a time.
3. Stacking — Each succeeding layer is turned 90°, crisscross method.
4. Scrap Removal — When the tray is empty, it is a flat sheet of corrugated. Individual cartons and partitions create a scrap problem.

Large space savings result

The tray design has been used on numerous vendor parts. We have found that timers work very well in this design. Some of the other parts we have worked into this design are:

Terminal Blocks — Space savings of 50 per cent.

Thermostats — Space savings of 50-70 per cent.

Transformers — Space savings of 30 per cent.

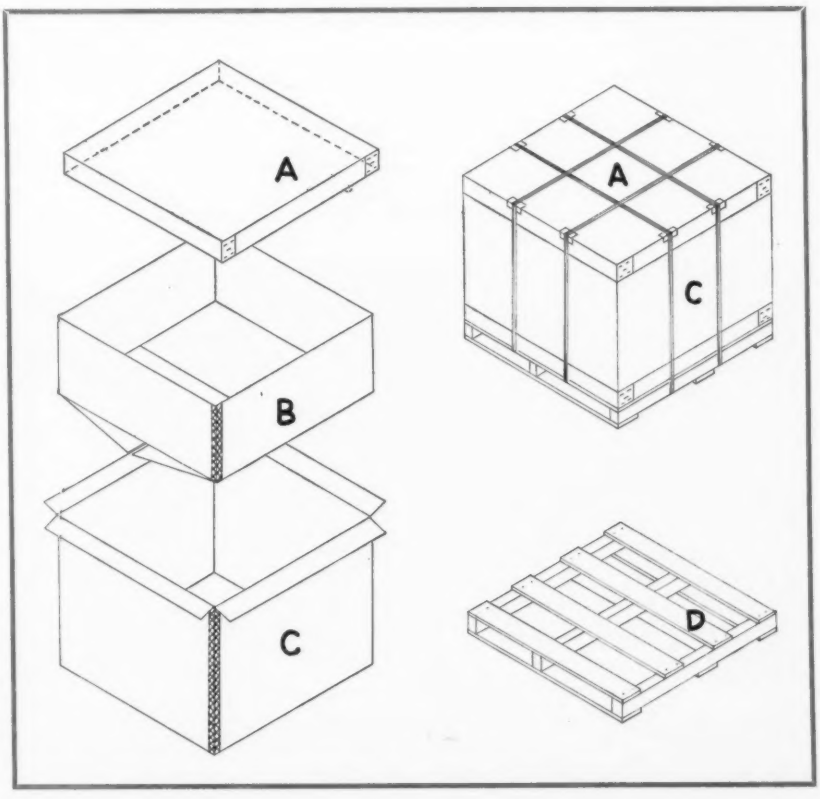
Timers — Space savings of 35 per cent.

Water Inlet Valves (Dole & Detroit Control) —Space savings of 20 per cent.

Water pressure switches, rotary electric switches, lid latches, and various solenoids.

We also have several other pallet packs that we use for bulk items, such as rubber hose. Due to many various sizes and shapes, we have had to work out three different packs, particularly for rubber parts.

Prior to our vendor program, the majority of rubber parts were received in cartons. The one exception was when we furnished skid boxes to the various



Component parts of the vendor pack are shown here. "A" is the cap used for the top and the bottom of the pack — 2 are required. "C" is the outside tube that is placed over the half-slotted carton "B" after it is filled with trays. The completed package is shown at right over the standard shop pallet "D".

Upper part of picture shows timers packed in old type cartons, and the lower part of the picture shows timers in the tray-type pallet pack.

vendors. This was somewhat of a problem, because we never had enough to go around or they were never there when needed. Parts such as rubber hose received in cartons, by the trailer load, took from three to five man hours to unload. The palletized method takes less than one man hour. In addition, the truck docks are not tied up for long periods of time.

Another example is the water inlet hoses. They were formerly packed twenty-five to a burlap bag, approximately eight feet long. The bags were laid in the truck like cordwood. This took four to six man hours to unload. Here again, it takes less than one man hour.

Develop carton packs

We also concentrated on individual carton packs. Several objectives were set up on the carton phase of the program:

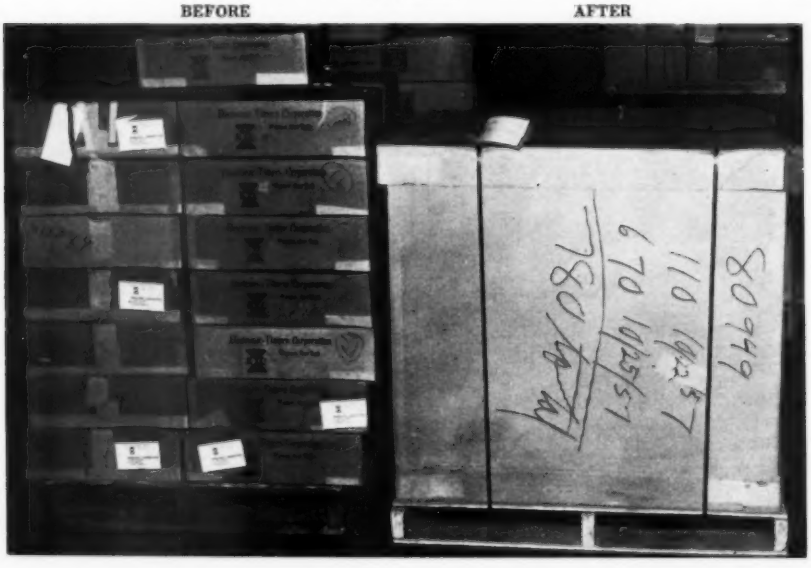
1. Size — Standard size carton for identical parts, where we had more than one vendor.
2. Strength.
3. Weight — Reduce to 55 lbs. for rate reasons.
4. Elimination of parts being wrapped by the use of partition packs or die cut sheets, etc.
5. Cost reduction.
6. Unit pack cartons where possible.

We did a considerable amount of work on the packing of fasteners, nuts, bolts and screws received from vendors. We have a considerable number of vendors furnishing these parts. Standardization of containers was our main objective. We also set up the standard nine keg pallet pack for large quantity shipments. We had a large number of vendors that were using wooden kegs for fasteners. Placing these on our 36″ x 48″ shop pallets meant waste space. The keg carton pack was set up for the standard, utilizing the 36″ x 48″ pallet to the maximum.

In just the first year of our vendor program, we showed savings in labor and materials of approximately $50,000.

One of the biggest advantages in this packaging program is the large storage space saved. Savings range from 20 to 70 per cent, depending on the part packaged. The "before" view here shows rubber parts as they were packed, and the same parts in the "after" view graphically show space saving. All pallets used are standard shop pallets.

BEFORE AFTER



NEW LITERATURE

→ *from Page 80*

Electrostatic Spray Painting

It can be proven that many cost saving benefits can be had if present production facilities justify conveyorized painting, according to a manufacturer of the electrocoating process. Up to fifty per cent less paint is said to be used by this system. A brochure is available which pictures many on-the-line examples of electro-coating on a wide variety of products, and describes a free survey service. Write Dept. MPM, Ransburg Electro-Coating Corp., Indianapolis 7, Indiana.

Maximum Finishing Oven Efficiency

Six questions are answered in a new booklet which carries the title above. Some of these are: Does the finishing system have capacity for increased production? Is the equipment simple enough to allow easy maintenance? What type of materials handling is best suited for a particular process in production? These are just a few of the questions answered in this booklet. For a free copy, write Dept. MPM, Michigan Oven Co., 411 Brainard, Detroit 1, Mich.

Informative Booklet on Galvanized Sheet

Non-flaking galvanized sheet is one of the claims made in a booklet which describes steel that is available in coils or cut lengths up to 60″ in width, and gauges 8 to 30 inclusive. This zinc-coating is said to resist flaking under the toughest conditions. The coating stretches with the base metal during fabrication, according to the manufacturer. For a free booklet describing this sheet, write Dept. MPM, Inland Steel Co., 30 W. Monroe St., Chicago 3, Ill.

Complete Booklet on Automatic Spray Painting Machinery

A series of bulletins is available, completely describing the equipment for automatic spraying. Hot spraying, dip coating, spray guns, spray booths, and fluid hose are some of the items described in this series of bulletins. Information is supplied on gun positions and angles which can be precisely set to coat a product quickly, uniformly and with accurate lapping and minimum over-spray, according to the manufacturer. Write Dept. MPM for Series I-8000 Bulletins, Devilbiss Co., Toledo 1, Ohio.

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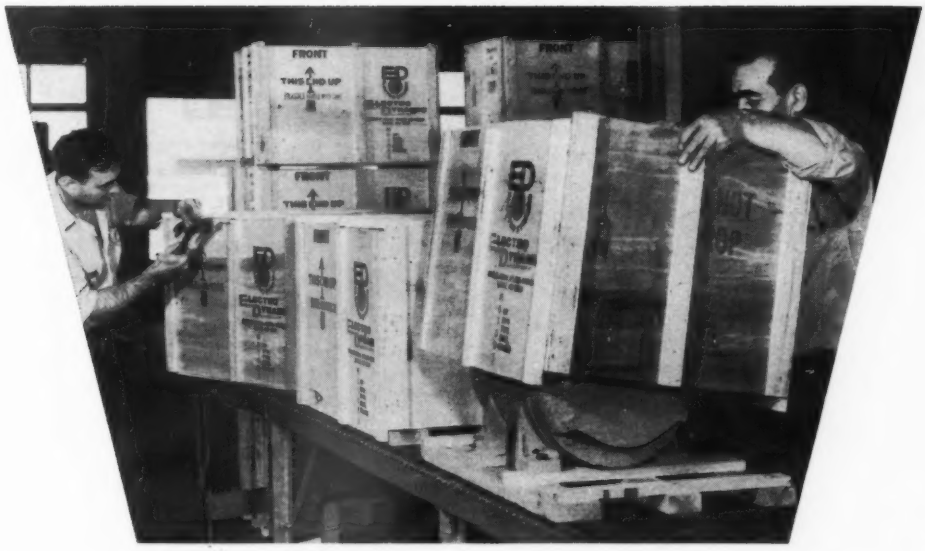

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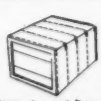

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As part of its materials handling program, the Bendix Products Division of the Bendix Aviation Corporation at South Bend, Indiana, is specifying that many of its suppliers ship in Wirebound Pallet Boxes. Of course, it's easy to understand why. They are suitably constructed for fork-lift truck handling thus facilitating materials handling operations. They have cut packing time, cut tare weight, and reduced damage claims. Wirebounds are famed for the economies they've effected.

Wirebound Pallet Boxes are made of tough wood reinforced with strong steel wire. You can stand 'em high without covers, fill 'em full and heavy... up to thousands of pounds. They handle any bulk product, may be stored indoors or out, can be made resilient or rigid, expendable or reusable—according to the requirements of the specific use.

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"Wirebound Pallet Boxes". It gives full details on rugged, ready, reliable Wirebound Pallet Boxes, industry's handiest helpers.

WIREBOUND BOX MANUFACTURERS ASSOCIATION
Room 1154, 327 South LaSalle Street, Chicago 4, Illinois

Wirebound
BOXES & CRATES

New Literature

→ *from Page 86*

Zinc Coated Steel Booklet

A continuous process zinc coating on steel is available, which is said to thrive on the toughest fabrications steps — spinning, deep drawing, roll forming and extrusion. Prolonged die life is said to be an advantage because of the lubricative quality of the steel's zinc coating. Send for the new booklet from Weirton Steel Co., Dept. R-6, Weirton, W. Va.

Unusual Results in New Finishing System

Either radiant or convection heating, and a combination of both, is available in a finishing system oven that has been improved to the point where certain manufacturers have reported increases in efficiency. One of these manufacturers found that 4,000 lbs. of organic finished parts are produced per hour at a cost of $6.50 per hour average over a six month period, according to the manufacturer. For a booklet describing this equipment, write Dept. MPM, Burdette Mfg. Co., 4918 S. Monitor Ave., Chicago 38, Ill.

Finishing Systems Catalog

To help improve painting operations, this company maintains a staff of specialists available upon request for a free survey of requirements. This company emphasizes the importance of a thorough analysis to determine the proper method of cleaning, paint application, curing, and conveying for a specific situation. For more information, send for a new catalog from Dept. MPM, Metalwash, 915 North Ave., Elizabeth 4, N. J.

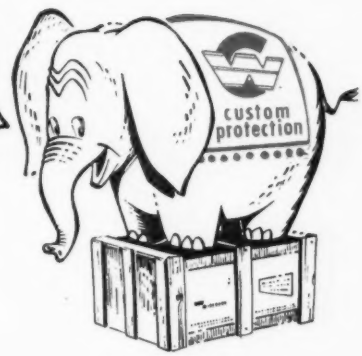
New Switches are Compact, Easy to Wire

A new, improved design for Type "E" general-purpose enclosed switches is available. The switches feature a compact enclosure that provides for easy installation, with a design that exposes the inside switch terminals for easy wire connection by separating the enclosure into two halves. The second improvement is a new one-piece molded insulator-seal that is cemented permanently into the bottom half of the enclosure. This replaces the wrap-around insulator and separate gasket formerly used to simplify handling and improve the insulating and sealing qualities of the switch. For a data sheet on these switches, write for Number 145, Dept. MPM, Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

McGRAW EDISON

McGraw-Edison Company
Insures Damage-Free
Arrival of Its Products
with Watkins Containers.

"Let the package carry the product, **NOT** the product carry the package"



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5. Easy Handling
6. Minimum Storage Space
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Porcelain enamels

→ *from Page 82*

stage. Absorption of atmospheric moisture by the highly-alkaline coating often causes trouble.

In review, progress in the field of applying porcelain enamels to aluminum and aluminized steel continues to be encouraging. New uses for porcelain enamels on aluminum are constantly being investigated. In addition to the major architectural applications, new uses in cooking ware, sanitary ware, and appliances are being seriously investigated.

REPRINTS AVAILABLE

A STUDY OF THE CHARACTERISTICS OF ANODIZED ALUMINUM ALLOYS by R. V. Vanden Berg, Aluminum Company of America. Six pages — black and white. Covers a wide variety of surface treatments available for aluminum, and the many finish characteristics. 25¢ per copy.

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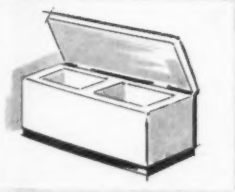
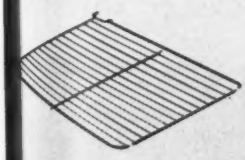
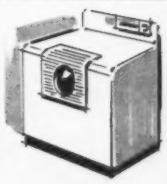
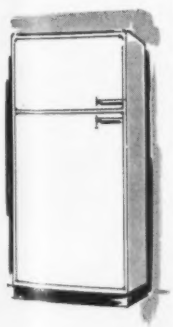
Naturally—she wants far more than exterior beauty and styling. She also wants the convenience of practical long lasting, easy-to-maintain refrigerator shelving, baskets and other necessary components. For continued satisfaction and repeat purchases she must have the type of product engineering that will guarantee more years of durable, dependable, maintenance-free operation from each working part of her new appliance.

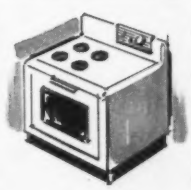
Remember, she's the expert and your best home front salesman, too! Consequently, you just can't afford to compromise quality for price at any point. Your new appliance may call for refrigerator shelving, baskets, trays, freezer components—or oven racks, element frames, side runners—perhaps even grills and guards. Then why not remember the one experienced source for your welded wire components? Union Steel's half-century of leadership in the design, fabrication, 100% inspection and on-time delivery of better, more dependable wire products can be yours at this very moment.











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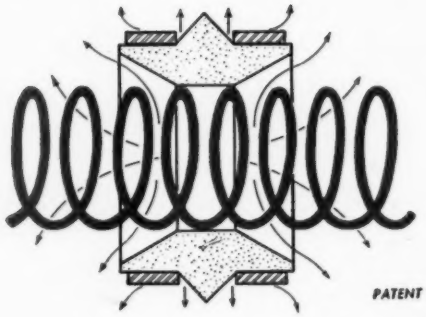
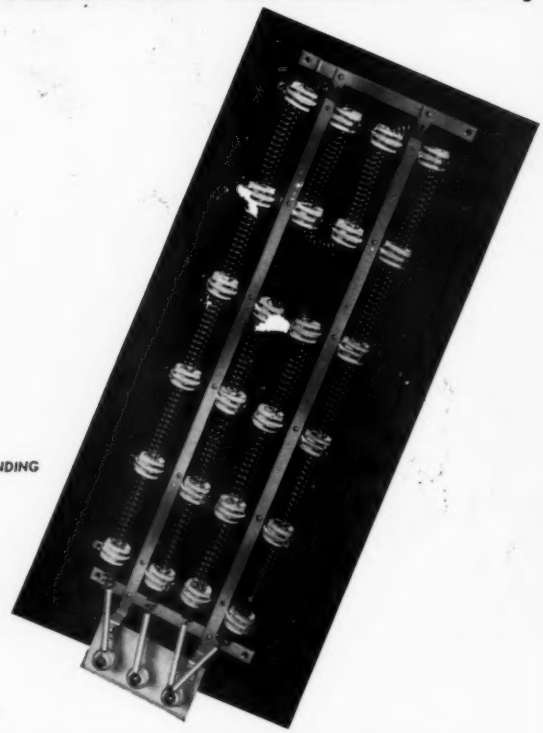
NEW EXCLUSIVE TEP HEAT DESIGN NOW GIVES YOU LONGER HEATING ELEMENT LIFE, BETTER PERFORMANCE



PATENT PENDING

Cross-sectional view of new TEP insulator and cross-bar design. More space for air circulation assures better heat dissipation, longer wire life.



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- FLOATING FRAME CONSTRUCTION — "TEP" patented feature allows unit frame to breathe; flexibility lengthens frame life. Rigidly welded frames distort, or welds break.
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- 14-POINT ASSEMBLY LINE INSPECTION — plus 30 years of experience in electrical heating applications, guarantees quality and well designed units.
- SPECIAL NICKEL PLATING — exclusive "TEP" process assures a chrome-like finish, eliminates corrosion.

TEP Products

New, Slotted Cross Bars, Diamond-Shaped Insulators Reduce Heat Build-Up in Critical Zones

Striving always to build better heating elements and improve performance, TEP Engineers have now developed a new, improved method of supporting insulators that insures faster heat dissipation. The experience of TEP Engineers over the years has proven that most heating element failures occur at points where heat is trapped inside the insulators. High temperature build-up in these areas has a direct effect on wire life.

Open Construction Prolongs Wire Life 50%

As illustrated, the new exclusive TEP Insulators are designed with a diamond-shaped cross-section and are mounted and retained in slotted, overlapping cross bars. This provides more space for air circulation through the insulator, assures faster heat dissipation, and increases wire life as much as 50%. In addition, TEP Insulators are made from porosity-controlled Steatite which reduces micro amp leakage by controlling moisture absorption. These and other exclusive TEP Heat features give you longer heating element life and better performance.

Write Today for Complete Data and Quotations.

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